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Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics

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As law and economics turns forty years old, its continued vitality is threatened by its unrealistic core behavioral assumption: that people subject to the law act rationally. Professors Korobkin and Ulen argue that law and economics can reinvigorate itself by replacing the rationality assumption with a more nuanced understanding of human behavior that draws on cognitive psychology, sociology, and other behavioral sciences, thus creating a new scholarly paradigm called "law and behavioral science." This article provides an early blueprint for research in this paradigm.

The authors first explain the various ways the rationality assumption is used in legal scholarship and why it leads to unsatisfying policy prescriptions. They then systematically examine the empirical evidence inconsistent with the rationality assumption and, drawing on a wide range of substantive areas of law, explain how normative policy conclusions of law and economics will change and improve under the law-and-behavioral-science approach.

INTRODUCTION

The law-and-economics movement has suffered from the truthfulness of one of its most important postulates: the law of diminishing marginal returns. Although law and economics was once viewed as a revolutionary approach to legal scholarship that applied the principles of microeconomic price theory to the analysis of legal rules, the value of its new insights is gradually diminishing.[1] The movement's vast initial successes were so

1. This is a theme in recent stocktaking by the profession. *See, e.g.*, Douglas G. Baird et al., *The Future of Law and Economics: Looking Forward*, 64 U. CHI. L. REV. 1129 (1997); Richard A. Epstein, *Law and Economics: Its Glorious Past and Clondy Future*, 64 U. CHI. L. REV. 1167 (1997). A decade ago, Robert Ellickson observed that "[T]he first generation of law and economics scholars has essentially accomplished the straightforward applications of the basic economic model in virtually every legal field. Current scholarship is more technical and interstitial." Robert C. Ellickson, *Bringing Culture and Human Frailty to Rational Actors: A Critique of Classical Law and Economics*, 65 CHI.-KENT L. REV. 23, 24 (1989).

sweeping that the current pliers of the trade have been forced to search for more narrow niches to fill. As a result, the discipline often seems to be devolving into a subdiscipline of applied economics that happens to focus substantively on legal matters.[2] What began as a form of legal analysis that employed economics as a tool is now too often economic analysis that uses law as a target. Mathematical elegance often becomes the primary goal,[3] with usefulness in the realm of law, that combines logic with human experience,[4] a mere afterthought.[5]

The seminal insight that economics provides to the analysis of law is that people respond to incentives—a generalized statement of price theory.[6] From this insight, two important corollaries follow. First, the law can serve as a powerful tool to encourage socially desirable conduct and discourage undesirable conduct. In the hands of skillful policymakers, the law can be used to subsidize some behaviors and to tax others. Second, the law has efficiency consequences as well as distributive consequences. Intentionally or unintentionally, legal rules can encourage or discourage the production of social resources and the efficient allocation of those resources. Although efficiency need not be the sole or primary goal of legal policy,[7] economic analysis of law teaches that policymakers ignore the efficiency implications of their actions at society's peril. Legal rights that are unobjectionable in the abstract are not free but rather must be measured against their opportunity costs.[8]

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2. This is not to say that there are not some ongoing, exciting research projects in law and economics. One such project is the study of the legal and economic aspects of social norms, a literature that we investigate in Part IV.A. below. Another is the emerging body of literature on game theory, a branch of microeconomics largely neglected during the first two decades of the law-and-economics movement that has only recently been brought to bear on legal analysis. *See, e.g.*, DOUGLAS G. BAIRD ET AL., GAME THEORY AND THE LAW xi (1994) (arguing that game theory explains how laws affect behavior); Ian Ayres, *Three Approaches to Modeling Corporate Games: Some Observations*, 60 U. CIN. L. REV. 419 (1991); Eric Talley, *Interdisciplinary Gap Filling: Game Theory and the Law*, 22 L. & SOC. INQUIRY 1055 (1997).

3. This criticism is often made of microeconomics research conducted in economics departments as well. *See, e.g.*, Mark Blaug, *The Disease of Formalism in the Economics, or Bad Games That Economists Play* 8, Jena Lectures, ISSN-Nr. 0947-1561 (1998) (calling "the worship of the idol of . . . mathematical rigor" the "'original sin' in economic methodology").

4. *See, e.g.*, OLIVER WENDELL HOLMES, THE COMMON LAW 5 (Mark DeWolfe Howe ed., 1963) ("The life of the law has not been logic: it has been experience.").

5. *Cf.* Ellickson, *supra* note 1, at 32-33 (calling law and economics a "technical sideshow" in which scholars with only a modest amount of technical training have difficulty making contributions).

6. *See, e.g.*, STEVEN E. LANDSBURG, THE ARMCHAIR ECONOMIST: ECONOMICS AND EVERYDAY LIFE 1-9 (1993) (explaining that the heart of economics is that "[p]eople respond to incentives" and using the example that safer cars may induce people to drive more carelessly).

7. *Cf.* Russell B. Korobkin & Thomas S. Ulen, *Efficiency and Equity: What Can Be Gained from Combining Coase and Rawls?*, 73 WASH. L. REV. 329 (1998) (suggesting ways that legal rules can take account of efficiency and equity concerns simultaneously).

8. One need not conclude that law and economics leads to a wholesale overthrow of settled legal learning. Sometimes it does, as, for example, when it suggests that parties to contracts should have greater latitude to stipulate damages than the law currently allows. *See* ROBERT COOTER & THOMAS ULEN, LAW AND ECONOMICS 235-37 (3d ed. 2000). But just as frequently, law and economics

Law and economics is, at root, a behavioral theory, and therein lies its true power. The concern of law and economics with how actors in and subject to the legal system respond to legal directives (and would respond to hypothesized changes in those directives) now permeates the mainstream of legal academic thought, far beyond the boundaries of scholarship that is self-consciously part of the law-and-economics tradition. This concern was by no means "invented" by the law-and-economics movement but certainly universalized by it. Indeed, it is so widely acknowledged and accepted that it hardly bears mentioning in the modern legal academy that law does not exist in a vacuum; rather, it has real effects on private behavior, and those effects should be considered and accounted for when examining alternative legal regimes.

To speak coherently of the legal implications of viewing law as a series of incentives, analysts have to make assumptions about the consequences of those incentives to the people subject to the legal system. To satisfy this need, early law-and-economics scholars imported from economics a series of assumptions about how people respond to incentives, known generally as "rational choice theory." There is considerable debate within both the economics and law-and-economics communities about precisely what rational choice theory is and is not. As it is applied implicitly or explicitly in the law-and-economics literature, however, it is understood alternatively as a relatively weak, or "thin," presumption that individuals act to maximize their expected utility, however they define this, or as a relatively strong, or "thick," presumption that individuals act to maximize their self-interest.[9]

Rational choice theory provided what was, no doubt, the best series of assumptions upon which to begin to develop the application of price theory to legal rules. The use of rational choice theory enabled the law-and-economics movement, in its early days, to achieve significant advances in understanding the interaction between legal rules and society. But now that the movement has reached intellectual maturity, the rationality assumption severely limits its continued scholarly development. There is simply too much credible experimental evidence that individuals frequently act in ways that are incompatible with the assumptions of rational choice theory.[10] It follows that the analysis of the incentive effects of legal rules

provides an alternative justification for prevailing legal rules and institutions, as, for example, when it concludes that there is a deep economic logic to the basic structure of tort liability. *See id.* at 300-28; *see also* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF TORT LAW (1987); STEVEN SHAVELL, ECONOMIC ANALYSIS OF ACCIDENT LAW (1987).

9. We discuss alternative definitions of rational choice theory in Part I.A, *infra*.

10. A good deal of the evidence is discussed in Parts III-V, *infra*.

based on such implausible behavioral assumptions cannot possibly result in efficacious legal policy, at least not in all circumstances.[11]

After the law-and-economics movement had stretched its academic legs, it might well have concerned itself with developing a more complex and realistic theory (or theories) of behavior, one (or ones) that, perhaps, would be less amenable to formal modeling but more relevant to creating legal policy.[12] But the movement has not yet fully begun to do this, although we sense that it is beginning to move in this direction.[13] The longer that the field delays in elaborating this richer theory of behavior—the longer, that is, that it fails to take the "law" part of "law and economics" seriously—the more it engages in a deep irony: although the movement has become more deeply entrenched in the legal academy[14] and continues to gain adherents and scholarly practitioners of its arts,[15] it has become less relevant to the making of legal policy, one of the ultimate ends of legal scholarship.[16]

As the rate of increase in the breadth and usefulness of law-and-economics scholarship has declined, the shortcomings of rational choice theory have become more apparent. Behavioral anomalies and puzzles that rational choice theory (at least relatively strong versions) cannot explain—once little noticed because of the considerable utility rational choice theory did have—began to appear more significant as the economic analysis of law gained influence within the legal community. In the wake of increasing

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11. *See* Jon Elster, *When Rationality Fails*, *in* THE LIMITS OF RATIONALITY 19 (Karen Schweers Cook & Margaret Levi eds., 1990).

12. Law and economics was not universally welcomed among legal scholars or practitioners as a liberator from a dark night of legal studies. Rather, a common criticism of law and economics was that its assumption of rational behavior by legal decision makers was preposterous. *See generally* Thomas S. Ulen, *Rational Choice and the Economic Analysis of Law*, 19 L. & SOC. INQUIRY 487, 488 (1994) (noting widespread criticism of the law-and-economics movement based on the rational actor assumption).

13. *See, e.g.*, BEHAVIORAL LAW AND ECONOMICS (Cass R. Sunstein, ed., Cambridge University Press 2000); Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471 (1998); Cass Sunstein, *Behavioral Law and Economics: A Progress Report*, 1 AM. L. & ECON. REV. 115 (1999).

14. The two primary law-and-economics journals, the *Journal of Legal Studies* and the *Journal of Law and Economics*, are among the most prestigious and widely cited among law professors. *See* Colleen M. Cullen & S. Randall Kalberg, *Chicago-Kent Law Review Faculty Scholarship Survey*, 70 CHI.-KENT L. REV. 1445, 1453 (1995) (ranking the *Journal of Legal Studies* tenth and the *Journal of Law and Economics* fifteenth by number of citations in other law reviews).

15. The most recent issue of the Association of American Law Schools Directory lists 164 law professors as members of its section on law and economics. *See* THE AALS DIRECTORY OF LAW TEACHERS 1998-99, at 1175-76 (1998). No doubt this number far understates the number of law professors who conduct scholarly research within the law-and-economics paradigm.

16. This may be due to the fact that some commentators perceive a widening gap between the bar and the legal academy and speculate that the rise of law and economics is at least partially responsible for this gap. *See, e.g.*, ANTHONY T. KRONMAN, THE LOST LAWYER: FAILING IDEALS OF THE LEGAL PROFESSION 225-40 (1993); Harry T. Edwards, *The Growing Disjunction between Legal Education and the Legal Profession*, 91 MICH. L. REV. 34 (1992).

questions about the sanctity of the rational choice assumptions, the proponents of rational choice theory retrenched, as defenders of criticized paradigms often do,[17] and developed more sophisticated ways to paper over its empirical shortcomings and to denounce its critics as overly concerned with minor details not truly important to a general understanding of human behavior or to the critical analysis of law.[18] As a result, its proponents argue that rational choice theory is a still-viable description of human decision making.[19] Most, though by no means all, of the leading members of the law-and-economics movement in the legal academy are among these defenders.[20]

In response to these trends, a new movement is emerging in the legal academy that builds on the core insights of law-and-economics scholarship but takes seriously the shortcomings of rational choice theory.[21] This movement, which we call "law and behavioral science," lacks a single, coherent theory of behavior. Although such a general theory may someday develop and would be welcome, the movement's current lack of concern about this shortcoming identifies law and behavioral science as a species of legal pragmatism.[22] As we argue in this Article, one can analyze the

17. *See* THOMAS KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 77 (3d ed. 1996).

18. In economics there have always been those critical of the assumption of rational consumers, suppliers, bureaucrats, and other economic actors. The principal response has been that provided by the Nobel laureate Milton Friedman. Friedman argued that in any positive analysis the reality of assumption was secondary to the primary importance of having falsifiable predictions. *See* MILTON FRIEDMAN, ESSAYS IN POSITIVE ECONOMICS (1953). It might be argued, for example, that while the behavior of some individuals may deviate from that predicted by rational choice theory, those deviations are symmetrically distributed (and, by implication, without a great deal of variance) around the average behavior posited by that theory. Professor Gary Becker has also suggested that, even if a significant number of decision makers are irrational and the deviations are not always symmetrical, aggregate market behavior will still follow the predictions of standard microeconomic theory. *See* Gary Becker, *Irrational Behavior and Economic Theory*, 70 J. POL. ECON. 1 (1962).

19. This defense suggests that one should take the criticisms of rational choice theory seriously only to the extent that they describe *systematic* deviations. This is a fair point. As we show below, the experimental evidence establishes that the deviations are, indeed, systematic and not randomly distributed around a (rational actor) mean.

20. *See, e.g.*, Richard A. Posner, *Rational Choice, Behavioral Economics, and the Law*, 50 STAN. L. REV. 1551 (1998) (commenting ou Jolls et al., *supra* note 13, and arguing that behavioral economics has no theory, is antitheoretical, and that rational choice is both descriptively and normatively superior).

21. As Donald Langevoort observes, elements of the relevant behavioral research have been employed in legal scholarship from time to time for a number of years, although the attempt to bring together the various insights from this research into a coherent movement is a very recent development. *See* Donald C. Langevoort, *Behavioral Theories of Judgment and Decision Making in Legal Scholarship: A Literature Review*, 51 VAND. L. REV. 1499, 1502 (1998). For examples of recent efforts to address the limitations of rational choice theory, see sources cited *supra* note 13.

22. *See* Thomas F. Cotter, *Legal Pragmatism and the Law and Economics Movement*, 84 GEO. L.J. 2071, 2072 (1996) (describing legal pragmatists as rejecting the notion that legal doctrine must be based on a grand theory). Cotter argues that law and economics itself is not necessarily inconsistent with pragmatism, but he concedes that much of the work of law-and-economics scholars is inconsistent with pragmatism since it relies on strict foundational assumptions about human nature. *See id.*

appropriate legal command in any given circumstance without a grand, overarching theory of behavior so long as one has a due regard for the relevant decision-making capabilities of the actors in that specific setting. By borrowing from psychological and sociocultural theories in addition to economics, the law-and-behavioral-science approach consciously chooses to emphasize its external usefulness in analyzing legal problems rather than either its internal elegance or universal applicability. Its ultimate goal, quite simply, is to understand the incentive effects of law better than modern law and economics is able to do by enlisting more sophisticated understandings of both the ends of those governed by law and the means by which they attempt to achieve their ends.

Applying behavioral models more nuanced and sophisticated than rational choice theory to legal rules and systems will require a broader range of academic forms than is traditionally found in legal scholarship, in addition to a broader theoretical base. In the early stages of the movement, legal scholars have been able, by and large, to make important strides by hypothesizing that empirical and experimental findings published by social science researchers apply to actors subject to legal commands.[23] To progress beyond the current initial stage of scholarship, legal scholars will have to conduct more empirical and experimental work of their own to test whether these hypotheses are in fact true in the particularized settings they study. To use one example, findings by cognitive psychologists that student research subjects make exchanges in a certain way seems a fair place to begin an inquiry into the incentive effects of commercial law but an insufficient foundation on which to base a proposal for amending the Uniform Commercial Code. Before such legal reform proposals will be taken seriously outside the academy, legal scholars will have to develop tangible evidence that commercial actors in commercial settings are likely to respond to incentives in the same way as do student subjects.[24]

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23. For a good overview of the range of legal literature that applies, to some degree, to social science research on behavior that is inconsistent with rational choice theory, see Langevoort, *supra* note 21, at 1506-19.

24. Our call for a new scholarship in law based on behavioral science does not precisely follow the traditional pattern of emendation in the sciences, but there are parallels. A typical process by which the demand for a new theory arises is that significant anomalies appear in the application of the reigning paradigm, as Thomas Kuhn calls it, to empirical phenomena. When those anomalies become numerous, Kuhn hypothesizes that the scholarly community recognizes the desirability of a new paradigm that encompasses both the phenomena explained by the old paradigm and the anomalies. *See* KUHN, *supra* note 17, at 77.

The pattern that gives rise to a demand for behavioral science in law is more complicated. First, law and economics has not yet reached the stage in which empirical studies have uncovered so many *legal* anomalies that there is a clearly felt need for a paradigm to replace rational choice theory. But second, those working in other social sciences have found many empirical anomalies in the predictions of rational choice theory. In a notable column in the *Journal of Economic Perspectives* called "Anomalies," Richard Thaler and colleagues colleeted examples of these results. *See, e.g.*, Robyn M. Dawes & Richard H. Thaler, *Anomalies: Cooperation*, 2 J. ECON. PERSP. 187 (1988); Kenneth A.

This Article provides an early blueprint for research in "law and behavioral science,"[25] which we hope will help guide the emerging scholarship in this area. In Part I, we describe in more detail the applications and shortcomings of rational choice theory as a behavioral explanation useful to legal analysis. Parts II through IV survey a range of research findings from the behavioral sciences that collectively articulate a more subtle and realistic (although considerably less tidy) understanding of human behavior than that articulated in rational choice theory, and each part presents examples of how these findings are useful to the analysis of legal policy. Part II contends that, contrary to the usual understanding of rational choice theory by law-and-economics practitioners, persons subject to the legal system are seldom ruthless optimizers of their utility; rather, they often rely on a range of decision-making shortcuts and heuristics. Part III argues that the preferences of persons subject to law are not exogenous to the context in which the decision makers find themselves but are situationally dependent. Part IV contends that persons subject to the legal system routinely make specific choices that do not optimally serve their immediate self-interest. We conclude with our vision of how this Article might serve as a basis for a substantial research agenda for the next generation of scholars interested in the confluence of law and behavioral science.

Froot & Richard H. Thaler, *Anomalies: Foreign Exchange*, 4 J. ECON. PERSP. 179 (1990); Daniel Kahneman et al., *Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias*, 5 J. ECON. PERSP. 193 (1991); Charles M. C. Lee et al., *Anomalies: Closed-End Mutual Funds*, 4 J. ECON. PERSP. 153 (1990); George Loewenstein & Richard H. Thaler, *Anomalies: Intertemporal Choice*, 3 J. ECON. PERSP. 181 (1989); Richard H. Thaler, *Anomalies: Interindustry Wage Differentials*, 3 J. ECON. PERSP. 181 (1989); Richard H. Thaler, *Anomalies: Saving, Fungibility, and Mental Accounts*, 4 J. ECON. PERSP. 193 (1990); Richard H. Thaler, *Anomalies: Seasonal Movements in Security Prices II: Weekend, Holiday, Turn of the Month, and Intraday Effects*, 1 J. ECON. PERSP. 169 (1987); Richard H. Thaler, *Anomalies: The Ultimatum Game*, 2 J. ECON. PERSP. 195 (1988) [hereinafter Thaler, *The Ultimatum Game*]; Richard H. Thaler, *Anomalies: The Winner's Curse*, 2 J. ECON. PERSP. 191 (1988); Richard H. Thaler & William T. Ziemba, *Anomalies: Parimutuel Betting Markets: Racetracks and Lotteries*, 2 J. ECON. PERSP. 161 (1988); Amos Tversky & Richard H. Thaler, *Anomalies: Preference Reversals*, 4 J. ECON. PERSP. 201 (1990). We posit in this Article that these anomalies in other social science fields would have been found in empirical legal studies if such studies were to occur. (Some have, and we report on them below.) Moreover, as we have stressed and will stress again, we are not in a position to develop a new paradigm to replace rational choice theory. Our aim is simply to incorporate the wide-ranging experimental results from other social sciences into law and economics so as to refine the connection between predicted human behavior and the attainment of the goals of the legal system.

25. For other examples, see sources cited *supra* note 13; *see also* Langevoort, *supra* note 21; Cass R. Sunstein, *Behavioral Analysis of Law*, 64 U. CHI. L. REV. 1175 (1997).

I

THE USES AND SHORTCOMINGS OF RATIONAL CHOICE THEORY

Rational choice theory is the heart of modern microeconomic theory.[26] It is such a powerful, straightforward, compelling, and useful construct that scholars in a wide range of disciplines contiguous to economics, such as political science, history, international relations, sociology, finance and accountancy, and, of course, law, have adopted rational choice theory as their central account of human decision making.[27] Unfortunately for the purposes of precise analysis, there is no single, widely accepted definition of rational choice theory.[28] Although the use of the assumption that actors behave rationally is pervasive among law-and-economics scholars, the assumption is most often implicit. As a result, there is rarely a discussion in the legal literature about what, exactly, constitutes rational behavior. In actuality, there are probably nearly as many different conceptions of rational choice theory as there are scholars who implicitly employ it in their work.

The variety of conceptions of rational choice theory makes critiquing the theory something akin to shooting at a moving target. We will simplify the task somewhat by positing that versions of the theory can be aligned along a spectrum and then addressing four specific points along the spectrum representing the most common conceptions of the theory, as it is employed in legal scholarship.

A. Conceptions of Rational Choice Theory

The different conceptions of rational choice theory can be understood as points along a continuum of how specific and precise the predictions of the theory are. On the left side of the spectrum are "thin" conceptions of rational choice theory—that is, conceptions in which the theory is relatively undemanding and in which it is relatively easy for the behavior of actors to be consistent with the theory. On the right side of the spectrum are "thick" conceptions of the theory—that is, conceptions with more robust behavioral predictions that are more easily falsifiable by empirical

26. *See, e.g.*, RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 3 (5th ed. 1998) ("The task of economics . . . is to explore the implications of assuming that man is a rational maximizer of his ends in life.").

27. Of course, rational choice theory has not gained a dominant market share in these disciplines without a fight. The level of objection to rational choice theory can be seen as a measure of the theory's success in the academy. *Cf.* DONALD P. GREEN & IAN SHAPIRO, PATHOLOGIES OF RATIONAL CHOICE THEORY: A CRITIQUE OF APPLICATIONS IN POLITICAL SCIENCE (1994) (attacking the use of rational choice theory in political science).

28. Nonetheless, as we shall see there is a core set of understandings of what rational choice theory is. *See* Thomas S. Ulen, *Rational Choice Theory in Law and Economics*, *in* ENCYCLOPEDIA OF LAW AND ECONOMICS (Boudwijn Bockaert & Gerrit De Geest eds., 1999); *see also* GREEN & SHAPIRO, *supra* note 27, at 13.

evidence.[29] Figure 1 illustrates the construct, with the dominant conceptions of the theory in bold:

RATIONAL CHOICE THEORY SPECTRUM

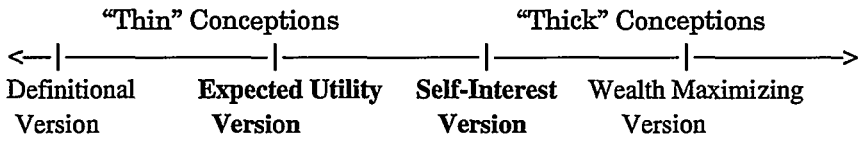

FIGURE 1

1. *The Definitional Version*

In its thinnest version, rational choice theory is definitional in nature. This conception postulates only that, as Richard Posner has written, "man is a rational maximizer of his ends,"[30] without providing any predictions regarding what ends an individual might attempt to maximize or what means he might employ in such an effort. On this account, rationality is understood as suiting means to ends, but no normative theory of either means or ends is assumed.[31]

One can conceive of a situation in which the prediction of this thin theory (that economic decision makers choose means well suited to achieving their ends) would not hold—namely, when an individual chooses an action contrary to his goals. But in practice the definitional version of rational choice theory is nonfalsifiable, because both the means and the ends of behavior are defined by observing the behavior itself. Put another way, rational behavior is understood as "the way people act." Because we assume a priori that people "rationally maximize their ends" (or their "utility"), we characterize as rational any behavior that we see and any behavior that can be justified as "rational" merely by noting its existence. Even behavior that seems anomalous, such as clucking like a chicken

29. The thin/thick dichotomy is borrowed from GREEN & SHAPIRO, *supra* note 27, at 17-18; *see also* John Ferejohn, *Rationality and Interpretation: Parliamentary Elections in Early Stuart England*, *in* THE ECONOMIC APPROACH TO POLITICS: A CRITICAL REASSESSMENT OF THE THEORY OF RATIONAL ACTION (Kristen Renwick Monroe ed., 1991).

30. Richard A. Posner, *Are We One Self or Multiple Selves?: Implications for Law and Public Policy*, 3 LEGAL THEORY 23, 24 (1997).

31. The distinction between rational means and rational ends deserves far more attention than economists have given it. Moreover, economists should also pay particular attention to rational belief. The connection between action and belief is straightforward: presumably individuals act in accord with their beliefs, and individuals seek to have rational beliefs, those that are consistent and held for supportable reasons. *See* ROBERT NOZICK, THE NATURE OF RATIONALITY 64-106 (1993). Many other commentators have remarked on the thin description of human motives contained in the economist's (thin) definition of rationality. For a representative view, see Martha C. Nussbaum, *Flawed Foundations: The Philosophical Critique of (a Particular Type of) Economics*, 64 U. CHI. L. REV. 1197 (1997).

whenever a bell sounds, is presumed to be well suited to achieving the ends of the clucker.

On this thin understanding, everything confirms the rationality of behavior, and nothing refutes it. As Arthur Leff noted in an early critique of the law-and-economics movement, this use of rational choice theory substitutes a definition for a normative or empirical proposition.[32]

2. *The Expected Utility Version*

The next conception of rational choice theory, and the one most dominant in modern microeconomics,[33] is often termed "expected utility theory."[34] This conception, like the definitional version, is "thin" in the sense that it does not specify what preferences or goals decision makers will pursue.[35] As before, the particular preferences or tastes contained in the actors' utility functions are exogenous, that is, given from outside the maximization problem. The expected utility version is, however, "thicker" than the definitional version because it does specify the means (or at least some of the means) by which actors will seek to satisfy their goals and preferences.

The assumption that economic decision making can be shown to be the result of the maximization of expected utility, subject to constraints, is a thicker model of human behavior in that it posits a more formal model of individual decision making than does the version of rational choice theory considered in the previous Section. Consider expected utility theory's account of decision making under uncertainty. Suppose that an individual must choose between a certain and an uncertain course of action—for

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32. *See* Arthur Allen Leff, *Economic Analysis of Law: Some Realism About Nominalism*, 60 VA. L. REV. 451, 458 (1974) (reviewing the first edition of RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW (1973)). Leff's strong doubts about the usefulness of law and economics as an approach to legal scholarship seemed largely based on his understanding that the movement rested on a tautological definition of rational behavior. *See id.* at 482 (criticizing Posner for "substituting definitions for both facts and values"); *id.* at 478-79 ("In such a system whatever is, is. If you do not 'buy' something, you are *unwilling* to do so.").

33. *See* GREEN & SHAPIRO, *supra* note 27, at 18.

34. *See, e.g.*, Geoffrey Brennan, *Comment, What Might Rationality Fail to Do*, *in* THE LIMITS OF RATIONALITY 51, 52 (Karen Schweers Cook & Margaret Levi eds., 1990) (calling the "standard" version of rational choice theory "no more than the assumption that the agent is utility-maximizing"). The precise parameters of the expected utility theory version of rational choice theory, like rational choice theory itself, resist consensus. *See, e.g.*, SCOTT PLOUS, THE PSYCHOLOGY OF JUDGMENT AND DECISION MAKING 83 (1993) (noting that "expected utility theory is actually a *family* of theories"). Economists sometimes refer to subjective expected utility theory or SEU. The addition of the word "subjective" merely allows for the probabilities by which the decision maker weighs the utilities of uncertain outcomes to be subjective, rather than objective. Whether those probabilities are objective or subjective, they must obey the probability calculus—for example, the sum of the probabilities of all the possible outcomes must sum to one.

35. *See* Elster, *supra* note 11, at 20 (stating that rational choice theory "tells us what we ought to do in order to achieve our aims as well as possible. It does not, in the standard version, tell us what our aims ought to be").

example, between a certain return on an investment and an uncertain return on a more speculative investment. Suppose, further, that outcome O_1 occurs with certainty but that outcomes $O_2, \ldots, O_n$ are probabilistic: only one of them will eventuate, but they are all possible. How would the rational choice theorist predict that the actor will decide which investment to choose? The actor will presumably attach a utility to each possible outcome—$U(O_1)$, $U(O_2)$, and so forth, along with a probability of each outcome's occurring— p_1, p_2, and so on. Calculating the value of the certain course of action is straightforward. Because O_1 is certain to occur, $p_1 = 1$, so that the expected utility to the actor of O_1 equals $U(O_1)$. The uncertain investment presents more of a challenge to evaluate because the uncertain outcomes are mutually exclusive, $p_2 + \ldots + p_n = 1$. The decision maker can reduce the multiple possibilities to a single expected utility by solving:

$$EU(\text{uncertain action}) = p_2U(O_2) + \ldots + p_nU(O_n).$$

The rational consumer then compares the expected utility of the certain course of action with the expected utility of the uncertain course of action, and selects the one with the higher value.[36]

Stripped of its mathematical adornments, the basic requirement of expected utility theory is that decision makers conduct an explicit or implicit cost-benefit analysis of competing options and select the optimal method of achieving their goals (that is, the method that maximizes expected benefits and minimizes expected costs, or maximizes net expected benefits), subject to external constraints.[37]

If an actor makes a decision that does not maximize net expected benefits to him, then he violates the behavioral predictions of the expected utility version of rational choice theory. But because it is impossible to know what choices are optimal for a particular decision maker without knowing the contours of his utility function, and because utility functions are difficult to elicit,[38] the behavioral predictions of expected utility theory

36. An important element of expected utility theory is the decision maker's attitude toward risk. There are three possible attitudes: risk-aversion, risk-neutrality, and risk-preferring. If a person is risk-averse, then he or she prefers a certainty of, say, $100 to an uncertain prospect of $100 (for example, the compound possibility of receiving either $100,000 with probability of 0.001 or $0 with probability 0.999). If he is risk-neutral, then he is indifferent between a certainty of $100 and an uncertain prospect of $100. If he is risk-preferring (also termed risk-seeking), he prefers an uncertain prospect of $100 to a certainty of $100. For a more formal discussion, see COOTER & ULEN, *supra* note 8, at 46-49.

37. Jon Elster conceives of three "optimality conditions" of rational behavior: the action must be the best way for the actor to satisfy his preferences given his beliefs, the beliefs must be the best he could form given his information, and the amount of information collected must be optimal given the strength of his preferences. Elster, *supra* note 11, at 21.

38. It is possible to elicit utility functions. For example, to test whether consumers made product choices that maximized their utility, one group of experimenters asked experimental subjects a series of questions about their preferences for different product attributes before giving them a choice problem. Whether consumers made utility-maximizing decisions could then be determined by examining whether choices made conformed with the subjects' prior statements about their preferences. *See*

often are not directly verifiable or falsifiable. Fortunately, there are some necessary (but not sufficient) conditions of rational behavior under the expected utility model that analysts can observe. These are usually understood to include the following:

> (1) *Commensurability*: actors should be able to compare the utility consequences of all alternatives to each other;
> (2) *Transitivity*: if an actor prefers choice A to choice B and choice B to choice C, he should then prefer choice A to choice C;
> (3) *Invariance*: the preference between two or more choices should not depend on how the choice is presented or structured, so long as the outcome possibilities are constant;
> (4) *Cancellation*: a choice between options should not depend on features of the options that are identical; and
> (5) *Dominance*: an actor should never choose an option in which every feature is only as good as the features of a competing option, and at least one feature is not as good.[39]

If an actor fails to follow one or more of these principles, he cannot be making decisions consistent with the expected utility model. Consequently, the predictions of the model are testable, at least at some minimum level.

3. *The Self-Interest Version*

Still thicker versions of rational choice theory start from expected utility theory's predictions about the manner in which actors will attempt to achieve their utility, and add predictions about the actors' goals and preferences—that is, about the content of the actor's utility function. Perhaps the most common assumption about ends, that actors will seek to maximize what is in their self-interest, can be traced to Adam Smith's famous statement:

> It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our necessities but of their advantages.[40]

The implication is that if we can figure out what course of action will most profit the decision maker, we will be able to predict his course of action. This is an advance over the thin conceptions of rational choice in that it suggests falsifiable predictions about substantive behaviors, not just predictions about decision-making procedures.

Naresh K. Malhotra, *Information Load and Consumer Decision Making*, 8 J. CONSUMER RES. 419, 422-27 (1982).

39. *See* PLOUS, *supra* note 34, at 81-82.

40. ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 15 (James E. Thorold Rogers ed., London, Clarendon Press 1869).

Such thick versions of rational choice theory dominate the law-and-economics literature,[41] although the assumption is almost always implicit rather than explicit. Consider, for example, the simple prediction that if there is no punishment for littering, people will litter (the cost to an individual of disposing of his litter in a lawful manner exceeds the cost to him of observing his individual litter on the ground).[42] This prediction implicitly relies on the assumption that individuals are concerned with punishments they might receive, the disutility that they will suffer from looking at their own litter, and the time and energy it takes to dispose of litter, but not with the disutility others will suffer from looking at their litter. Or consider the prediction that if punitive damages were to be abolished or capped, more defective products would be produced.[43] This prediction relies on the assumption that product manufacturers are concerned with their own bottom line, and are concerned with the health and safety of their customers only to the extent that those issues demonstrably affect that bottom line.[44] Unlike the thin versions of rational choice theory, the self-interested version can lead to the creation of directly falsifiable behavioral predictions.

Suspecting an ambush, defenders of rational choice theory might at this point observe that it is plausible to hypothesize that a decision maker's "self-interest" might be served by taking account of the well-being of others, not just his or her own wants and desires.[45] Unfortunately, expanding the conception of "self-interest" to include other-regarding preferences in addition to selfish ones would rob the notion of "self-interest" of all of its predictive value.[46] We would no longer be able to predict that people would litter if doing so risks no punishment, or that products would be more

41. *Cf.* Jennifer Arlen, *Comment: The Future of Behavioral Economic Analysis of Law*, 51 VAND. L. REV. 1765, 1766 (1998) (observing that "[c]onventional law and economics assumes . . . that people are self-interested . . . ."); Jeffrey L. Harrison, *Egoism, Altruism, and Market Illusions: The Limits of Law and Economics*, 33 UCLA L. REV. 1309, 1320 (1986) ("My impression is that narrow self-interest . . . is the behavioral assumption most commonly employed by those applying economic analysis to law.").

42. *Cf.* POSNER, *supra* note 26, at 416-17 (claiming that fines for littering would have to be very heavy to be a significant deterrent given the high cost of apprehending litterers).

43. *See* COOTER & ULEN, *supra* note 8, at 352-53.

44. There is a great deal of debate about these matters in the law-and-economics literature. *See, e.g.*, A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 HARV. L. REV. 870 (1998) (arguing for the use of punitive damages as a method of creating efficient precautionary incentives when victims fail to bring actions against their injurers); W. Kip Viscusi, *The Social Costs of Punitive Damages Against Corporations in Environmental and Safety Torts*, 87 GEO. L.J. 285 (1998) (arguing that punitive damages ought not to be available because they fail to deter and are subject to grave error in assessment, with inefficient consequences); Theodore Eisenberg, *Measuring the Deterrent Effect of Punitive Damages*, 85 GEO. L.J. 347 (1998) (criticizing Viscusi's statistical tests of the effects of punitive damages).

45. *See* POSNER, *supra* note 26, at 4 ("self-interest should not be confused with selfishness; the happiness (or for that matter the misery) of other people may be part of one's satisfactions").

46. *See also* Jolls et al., *supra* note 13, at 1488-89 (arguing that such a flexible notion of rationality robs the theory "of any real predictive power").

dangerous without products liability law, because people walking in the park may or may not gain utility from keeping the park tidy for their neighbors, and manufacturers may or may not gain utility from preventing harm to their customers. Adam Smith's prediction would have to be rewritten to read:

> It is from *either* the benevolence of the butcher, the brewer, or the baker that we expect our dinner, *or* from their regard to their own interest. We address ourselves, to their humanity *and/or* their self-love, and talk to them of our necessities *and/or* of their advantages.[47]

The point is not that we believe actors seek to fulfill only selfish preferences—in fact, we argue quite the opposite below.[48] But if "self-interest" is defined to include anything that produces satisfaction for the decision maker, then the self-interest version of rational choice theory is no different from the thin expected utility version.[49]

4. *The Wealth Maximization Version*

The thickest conceptions of rational choice theory provide even more specific predictions about the ends of decision makers than does the self-interest version. The most common of these very thick conceptions is "wealth maximization": the prediction that actors will attempt to maximize their financial well-being or monetary situation. Nearly all law-and-economics literature on business organizations, following the neoclassical economic theory of firms,[50] is built on the explicit or implicit assumption that firms seek to maximize profits.[51] And much law-and-economics literature on individual behavior makes an analogous assumption (usually implicitly), at least in circumstances in which money is at stake.[52]

B. Limitations of Rational Choice Theory in Legal Analysis

None of the conceptions of rational choice theory discussed above is optimal for the purpose of understanding how actors will respond to the

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47. *Compare with supra* text accompanying note 40.

48. *See infra* Part IV.

49. *Cf.* Harrison, *supra* note 41, at 1311 (observing that broad definitions of self-interest are impossible to disprove).

50. *See* GREEN & SHAPIRO, *supra* note 27, at 18.

51. *See, e.g.*, COOTER & ULEN, *supra* note 8, at 26; A. MITCHELL POLINSKY, AN INTRODUCTION TO LAW AND ECONOMICS 10 (2d ed. 1989).

52. The term "wealth maximization" is used as a normative principle of policymaking, and criticized as such. *See, e.g.*, Gregory S. Crespi, *Does the Chicago School Need to Expand Its Curriculum?*, 22 L. & SOC. INQUIRY 149 (1997) (arguing that wealth maximization is an incoherent and incomplete theory of law); Thomas S. Ulen, *Professor Crespi on Chicago*, 22 L. & SOC. INQUIRY 191 (1997) (arguing that despite its problems there is a sound practical reason for counting only market-mediated preferences in choosing among alternative policies). Here we use the term only to refer to a positive theory of individual or firm behavior.

incentives that the law creates. The deficiencies of the different conceptions arise from one or both of two shortcomings: their inadequacy in predicting future behavior and the implausibility of their predictions. This Part will explain how these shortcomings affect the four primary versions of the theory introduced above. The remainder of the Article will suggest modifications and enhancements to rational choice theory necessary to develop an understanding of human decision making that is more useful in the formulation of legal policy.

1. The Inadequacy of Thin Versions of Rational Choice Theory

Thin conceptions of rational choice theory can serve as a useful tool for social scientists attempting to explain, classify, or label human behavior from an *ex post* perspective. By positing that actors will seek to maximize their utility, scholars can observe behavior and then reason backwards to an understanding of preferences (ends) and strategies (means).[53] Thin versions of rational choice theory thus can be viewed as useful for recognizing that people usually act the way they do for a reason and, consequently, that observable actions provide clues for understanding these unobservable "reasons." However, these advantages are of little use to the makers of legal policy, who need to choose among competing legal rules. Policymakers need to predict future behavior under various legal scenarios, not merely understand past actions in hindsight.

The inadequacy of rational choice theory is most obvious in its thinnest, definitional version, which offers no behavioral predictions at all. Consider, as an example, the parable of Buridan's ass, who faced a choice between two equidistant haystacks as a source of nourishment.[54] The definitional version of rational choice theory could offer no prediction as to which haystack the ass would choose, or whether he would choose neither. Because this version of the theory interprets all acts as rational, it would conclude, *ex post*, that it was rational for the ass to stand still and die of starvation.[55] Because he believed this version of rational choice theory to be the behavioral premise underlying the law-and-economics movement, Leff disparagingly referred to law and economics as "American legal nominalism."[56]

The expected utility version of rational choice theory, although it rises above mere tautology, is scarcely more adequate for generating behavioral

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53. *See, e.g.*, LANDSBURG, *supra* note 6, at 3. In a famous formulation, Paul Samuelson spoke of "revealed preferences"—revealed, that is, by actual market choices and argued that not all the axioms of rational choice theory were necessary for the law of demand. *See* PAUL ANTHONY SAMUELSON, FOUNDATIONS OF ECONOMIC ANALYSIS 90-113 (1947).

54. *See, e.g.*, Margaret Levi et. al., *Introduction: The Limits of Rationality, in* THE LIMITS OF RATIONALITY 1, 7 (Karen Schweers Cook & Margaret Levi eds., 1990).

55. *See id.*

56. Leff, *supra* note 32, at 459.

predictions *ex ante*. In virtually any imaginable situation of importance to legal policy, expected utility theory alone yields indeterminate predictions; not only does the theory fail to yield a single, unique behavioral prediction (the result that would be of most use to a policymaker), but it also fails to eliminate many conceivable possible actions.[57] This version of rational choice theory, like the definitional version, is helpless in predicting the action of Buridan's ass, because it provides no theory or account of the content of the ass's utility function. If we knew, for example, that survival was the ass's sole preference, then expected utility theory would lead to the prediction that the ass would choose one of the two haystacks. On the other hand, if we knew that the ass placed a higher value on avoiding difficult decisions than on remaining alive, expected utility theory would predict that the ass would stand still and perish. But without some theory about the content of the ass's preferences, either standing still or choosing a haystack could be rational.[58] Expected utility theory can yield only the prediction that the ass will not violate one of the observable necessary conditions of expected utility theory. For example, it would lead to a prediction that the ass will not announce that he cannot compare the value of choosing a haystack with the value of standing still and dying, because to do so would violate the principle of commensurability.[59]

To use an example of direct relevance to legal policy, consider the following question: if society wishes to reduce crime, assuming all other policy decisions are held constant, should it increase or decrease the length of prison sentences? Note that, although the former appears to be the obvious answer, it is only correct if we assume that most people prefer to live outside of prison than to be incarcerated. But recall that thin versions of rational choice theory cannot aid us in creating this assumption. Virtually no predictions can be made about decisions or behaviors without thickening the conception of rational choice theory to include some predictions about the content of preferences.[60]

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57. *Cf.* Elster, *supra* note 11, at 24 (noting that the implications of a theory should be not only determinate, but also unique).

58. *See* Brennan, *supra* note 34, at 53 (noting that under the "standard version" of rational choice theory, in which there are no substantive restrictions on the actor's preferences, "it is at least arguable that there is no action that [rational choice theory] rules out. That is, for virtually any action, there exists some purpose for which the action is best").

59. See *supra* Part I.A.2 for a list of the observable behavioral predictions associated with expected utility theory, including commensurability.

60. *Cf.* Brennan, *supra* note 34, at 53 ("Some restriction on the agent's ends . . . is required to give rationality any predictive bite.").

In a famous attempt to amend rational choice theory precisely to avoid the problems to which we have referred, George Stigler and Gary Becker posited that a more productive assumption for economics was not that tastes differed substantially among people but that they were relatively the same. On this assumption, differences in behavior arise because the relative prices, incomes, and other constraints faced by decision makers are different. *See* George J. Stigler & Gary S. Becker, *De Gustibus Non Est Disputandum*, 67 AM. ECON. REV. 76, 76 (1977).

2. *The Implausibility of Thin and Thick Versions*

Thin conceptions of rational choice theory, such as expected utility theory, are not only inadequately specified to be valuable to policymakers concerned with the incentive effects of law, but the behavioral predictions that they do make are also implausible as predictions of general applicability: that is, they have been demonstrated, as an empirical matter, to be substantially incorrect, at least under some conditions.

Thick conceptions of rational choice theory substantially avoid the inadequacy problem. They can be used to generate predictions about how actors will respond to alternative legal regimes and, thus, can serve as a useful tool for policymakers. A thick conception of rational choice theory, for example, could enable us to predict that Buridan's ass would value life sufficiently that it would be utility-maximizing to choose one of the haystacks, even if that meant suffering the pain of making a difficult choice. Thick conceptions, however, trade the inadequacy problem of thin conceptions for even more pronounced implausibility problems than those that plague thin conceptions. The predictions that they make about the preferences of actors (in addition to predictions about the means actors will use to satisfy their preferences) are demonstrably incorrect, at least in many circumstances. Buridan's ass, of course, did not choose either of the haystacks,[61] thus falsifying the prediction that would be produced by any thick conception of rational choice theory.

Thin and thick conceptions of rational choice theory share two types of implausibility problems. First, actors often fail to maximize their expected utility, but instead make suboptimal choices among competing options given a set of preferences and use a range of heuristics—rules of thumb[62]—rather than complex cost-benefit analysis. This "bounded rationality" results from the high cost of processing information, the cognitive limitations of human beings, or a combination of the two. Evidence of these phenomena are detailed in Part II below.

Second, while all but the thinnest versions of rational choice theory assume that decision makers conduct a cost-benefit analysis that is invariant to factors external to their choice, context is quite important to behavior. How individuals will respond to legal rules depends on what reference points individuals recognize when making decisions. Decisions and behaviors are often affected by such factors as how an actor perceives choices relative to the status quo, whether choices are consistent or inconsistent with an actor's habits or traditions, and the temporal distance of the rule's effects. In Part III, we describe experimental evidence from the behavioral sciences that makes these and related points.

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61. *See* Levi et al., *supra* note 54, at 7.

62. For a general discussion of heuristics, see IRWIN P. LEVIN & JAMES V. HINRICHS, EXPERIMENTAL PSYCHOLOGY: CONTEMPORARY METHODS AND APPLICATIONS 246-48 (1995).

Thick versions of rational choice theory face yet an additional implausibility problem. There is substantial evidence that decision makers often behave in ways that are inconsistent with their direct self-interest.[63] Individuals form preferences not merely according to their subjective conceptions of well-being, but also in accordance with norms that are often socially constructed and sometimes evolutionarily adaptive. Some preferences well established in the behavioral sciences, such as a commitment to notions of fairness or social justice even at a cost to the self, might be ingrained by social or genetic forces, or by both. We discuss evidence of these preferences in Part IV.

C. The Responses of Rational Choice Theory to Criticisms

Defenders of rational choice theory, when confronted with the sorts of criticisms that we have voiced, generally respond in one of three ways, none of which is satisfying.

The first defense is an evolutionary account of decision making, which asserts that actors who fail to make rational decisions cannot survive in a competitive world. In the competition for resources, utility-maximizing behavior will drive out nonmaximizing behavior. The argument is most compelling in the context of business enterprises. Organizations will seek to maximize profits, and those that fail to do so will be put out of business by a lack of customers, capital, or both.[64] Even when complexity or ambiguity would appear to make optimization impossible or unduly costly, those that manage to optimize, even by chance, will survive, and their strategies will be emulated by competitors.

We find this account unconvincing as it pertains to individuals. With rare exception, individuals who fail to maximize their utility are not "driven out of the market." They might (although not necessarily) enjoy less happiness than their more rational counterparts, but they will live to make decisions another day.[65]

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63. Of course, it can be argued that all actions taken by an individual are at least indirectly in his self-interest. But to put the point this way is merely to adopt the definitional version of rational choice theory: that is, to claim that we know all actions are self-interested because individuals only act in their self-interest.

64. *See, e.g.*, Donald C. Langevoort, *Organized Illusions: A Behavioral Theory of Why Corporations Mislead Stock Market Investors (and Cause Other Social Harms)*, 146 U. PA. L. REV. 101, 101-02 (1997) (noting that, with minor modifications, the literature on corporations assumes that firms that "depart too far" from maximizing shareholder wealth will be driven out of business); Edward L. Rubin, *Putting Rational Actors in Their Place: Economics and Phenomenology*, 51 VAND. L. REV. 1705, 1715 (1998) ("Neoclassical economists believe that the competitive market will induce optimal behavior among firms by shaping those that are adaptable, and eliminating those that are not.").

65. As one group of authors put the point: "Being a bad criminal is rarely fatal, and except possibly for organized crime, there is little opportunity for 'hostile takeovers.'" Jolls et al., *supra* note 13, at 1486.

Even with regard to business enterprises, for which the evolutionary force of economic rationality might be most forceful, the account is unlikely to be true in most circumstances. Certainly, firms that make clearly suboptimal decisions routinely or in extremely important circumstances may be driven out of business, but competition in product or capital markets is rarely so perfect that a firm that occasionally makes decisions that fail to maximize profits will face bankruptcy or be taken over by firms that do maximize.[66] In any event, if it were true that competition drives imperfectly rational behavior out of business markets, such results would not occur instantaneously, and at any given moment in time a substantial number of participants in markets would likely be imperfectly rational actors who have not yet learned their lessons.[67]

A weaker version of this defense concedes that many individual and even some firm mistakes are not fatal, but stresses that actors learn from experience and correct failures of rationality.[68] This argument doubtlessly has validity, in the sense that there are circumstances in which correctives are possible within the rational choice theory. But we do not think that this point merits the weight that defenders place on it. First, many of the behaviors that we survey in Parts II through IV are persistent, even when experimenters bring them to the attention of their subjects. Second, learning from experience is a long-term strategy, and there will always be a substantial number of imperfectly rational actors who have not yet learned their lessons.

The second argument offered by defenders of rational choice theory when confronted with criticism is that rational choice theory, while not perfect, is the best single available behavioral theory. The theory's defenders contend that, even if the criticisms are accurate, they do not amount to a coherent theory of decision making that does a better job of predicting a wide range of human behavior than does rational choice theory.[69] As we

66. *Cf.* Langevoort, *supra* note 64, at 104 ("Empirical case studies abound of systemic decision-making flaws, with many of the examples drawn from companies hardly destined for Darwinian extinction."). Further, it might be adaptive for firms to suffer from decision-making biases if such biases are closely linked to other traits—confidence, optimism, forcefulness, for example—that provide a competitive advantage. *See id.* at 153-56.

67. *See, e.g., id.* at 148-49 (even if competitive forces eventually "weed out" poor decision makers, there will always be firms that make poor decisions that have not been weeded out yet); *cf.* Alexander Rosenberg, *Does Evolutionary Theory Give Comfort or Inspiration to Economics?, in* NATURAL IMAGES IN ECONOMIC THOUGHT 384 (Philip Mirowski ed., 1994) (arguing that the theory of natural selection does not hold promise for helping modern microeconomics to explain or predict economic phenomena).

68. *See, e.g.*, Arlen, *supra* note 41, at 1768 (citing Roberta Romano, *A Comment on Information Overload, Cognitive Illusions, and Their Implications for Public Policy*, 59 S. CAL. L. REV. 313 (1986)). Later, Arlen also cites market forces as a corrective for individual errors. *See id.* at 1777.

69. *See, e.g., id.* ("Behavioral economic analysis of law cannot serve as the basis for broad normative policy conclusions because it cannot provide a coherent alternative model of human behavior capable of generating testable predictions and policy conclusions in a wide range of areas.");

shall see, imperfectly rational actors undoubtedly utilize many different decision-making strategies, no single one of which provides a general behavioral description more realistic than rational choice theory.[70] In a commonly heard phrase around the academy, "It takes a theory to beat a theory,"[71] and these criticisms, even if correct, do not amount to a theory.

This rejoinder to the criticisms is sound, as far as it goes, but not particularly relevant to the project of developing a more nuanced understanding of behavior for use by legal policymakers. Rational choice theory is descriptively and prescriptively accurate more often than any other single theory of behavior, or so even its critics generally believe. But the elegance and parsimony that a single, universal theory of behavior such as rational choice can provide is of far less importance, if it is of any importance at all, to legal policymakers than to economists. The reason is that most laws are geared toward specific portions of the population or to people who play specific roles.

To be useful for legal policy, behavioral theories need to predict (with reasonable success) the likely responses to legal rules of the particular classes of actors to whom the rules are geared, whether or not the responses of other classes of actors would likely be identical. For instance, if policymakers are considering revising products liability law, they need a prediction of how product manufacturers, on one hand, and product consumers, on the other, will likely respond to competing proposals. The predicted responses of these two groups need not be identical, nor need they be the same as they would be for other groups operating in different contexts. Of course, it is possible that the predicted responses of the consumers of heavy machinery to a given phenomenon would be different from the predicted responses of consumers of toasters to that same phenomenon. If this is in fact the case, rather than default to a reliance on rational choice theory, policymakers should consider whether it would be efficacious for the law to approach products liability for industrial goods, which have a more limited, sophisticated market, differently than for mass consumer goods.

Crespi, *supra* note 52, at 167 (defending the "Chicago School's" version of economics against critics due to the lack of "alternative explanatory models of comparable scope and power"); Posner, *supra* note 20, at 1559-60 (criticizing behavioral economics on the ground that it is "undertheorized": "Describing, specifying, and classifying the empirical failures of a theory [that is, rational choice theory] is a valid and important scholarly activity. But it is not an alternative theory").

70. As Richard Thaler has observed, the term often used to describe research that contradicts rational choice theory, "behavioral decision theory," is somewhat of a misnomer because it is made up of more than one theory. Richard H. Thaler, *The Psychology of Choice and the Assumptions of Economics, in* QUASI RATIONAL ECONOMICS 137, 138 n.1 (1991).

71. Langevoort, *supra* note 21, at 1500 n.1 ("[T]he notion has arisen ... that 'it takes a theory to beat a theory ....'"); *cf.* Theodore J. St. Antoine, *How the Wagner Act Came to Be: A Prospectus*, 96 MICH. L. REV. 2201, 2208 (1998) ("[T]he severest critic of the New Deal's labor policy would have it that 'it takes a theory to beat a theory ....'").

There is no doubt that a single, universally applicable theory of behavior is convenient and highly desirable. But if universality is inconsistent with sophistication and realism, legal policymakers are better off foregoing universality and, instead, creating a collection of situation-specific minitheories useful in the analysis of discrete legal problems.[72] Moreover, there is a great deal to be said for an incremental approach to theory-building—that is, grafting on just enough theory to deal with the matter at hand rather than attempting to construct a universal theory. Cass Sunstein has recently argued that the common law process tends to produce "incompletely theorized arguments," by which he means that the decisions rendered by common law courts to resolve private disputes contain just enough theory to cover the instant facts and not the overarching theory or coherence that alternative institutions (such as a legislature) might seek to achieve as justification.[73] To try to do more by, for example, reaching a thorough and comprehensive theory, Sunstein argues, would produce discord. This view of the sometime superiority of common law adjudication is analogous to the pragmatic superiority of the law-and-behavioral-science approach that we advocate here.

The third defense is to respond to evidence of a purported failing of rational choice theory by explaining how the anomaly in question could possibly be consistent with the theory if viewed from a different angle.[74] This strategy avoids the problem of directly refuting or proving rational choice theory wrong, but in doing so the defender implicitly retreats to a conception of rational choice theory that is so thin that it can have no predictive value.

Consider, as an example, the contention that rational individuals will not pay attention to sunk costs when choosing between options because such costs cannot affect the marginal utility to be derived from future activities.[75] This leads to the prediction that an individual who has bought an expensive ticket to the symphony will be no more likely to attend than an individual who has been given a free ticket, assuming the two have an equal appreciation for classical music and that all other things are also equal. There is ample evidence that many people would in fact be more

72. *Cf.* Mark Kelman, *Behavioral Economics as Part of a Rhetorical Duet: A Response to Jolls, Sunstein, and Thaler*, 50 STAN. L. REV. 1577, 1586 (1998) (observing that behavioral economics does not suggest an alternative general theory of behavior to contrast with rational choice theory, but claiming that this fact does not "fatally wound [the] enterprise").

73. *See generally* Cass R. Sunstein, *Incompletely Theorized Agreements*, 108 HARV. L. REV. 1733 (1995).

74. For example, the new edition of Richard Posner's *Economic Analysis of Law* makes note of a few of the phenomena that we discuss *infra*, but claims that these "apparent departures from rationality may be explicable in rational-choice terms." POSNER, *supra* note 26, at 20.

75. "Sunk costs" (sometimes equated with "fixed costs") are costs that have already been incurred and do not vary with one's subsequent actions. An example is the annual subscription cost of a magazine. For a detailed discussion of this point, see *infra* Part III.E.

likely to attend the performance if they have paid for the ticket, reasoning that "the money would be wasted if I don't go."[76]

A clever proponent of rational choice theory might respond to this apparent violation of the theory by asserting that rational people are fully aware of the fact that they may be reluctant later to attend a particular concert, and, knowing that they will both enjoy the concert if they attend and that they will feel guilty if they allow an expensive ticket to go unused, they purchase a ticket in advance as a precommitment strategy to ensure their attendance. In other words, pre-purchase is used as a means to control one's tendency not to do things that may appear to be painful but are really desirable in the long run.[77]

Responses like this provide a useful way to understand behavior *ex post* (although the *ex post* account might well be inaccurate), but they also demonstrate the problem with relying on rational choice theory to inform future-oriented policymaking. The response makes it impossible to use rational choice theory to predict whether a person will be more likely to attend the symphony if he has purchased a ticket in advance (and has, therefore, "sunk" money into a symphony ticket) than if he were given the ticket for free. This defense of rational choice theory, in fact, demonstrates our basic contention that the theory can provide a plausible description of behavior only when the theory is adopted in such a thin form that it has little prescriptive value.[78]

D. Modifying the Behavioral Predictions of Rational Choice Theory

To claim that rational choice theory is an insufficient behavioral model on which to base legal policy is not to argue that individuals behave irrationally (although they certainly do in some circumstances). Rather, it is to assert that legal scholars seeking to understand the incentive effects of law in order to propose efficacious legal policy should not be limited to rational choice theory. The goal of the law-and-behavioral-science movement is not, at least at this stage, to replace rational choice theory with an inconsistent paradigm but to modify the implausible elements of rational

76. *See infra* note 297 and accompanying text.

77. These sorts of explanations have been a particular theme of the work of game theorist Thomas Schelling. *See, e.g.*, Thomas C. Schelling, *Self-Command in Practice, in Policy, and in a Theory of Rational Choice*, 74 AM. ECON. REV. 1, 1 (1984) (discussing the phenomenon that people will rationally seek to prevent, compel, or alter their future behavior, "to restrict [their] own options in violation of what [they] know[] will be [their] preference at the time the behavior is to take place").

78. Thus, we agree with the observation of Jolls, Sunstein, and Thaler that Richard Posner's contention that actors' demonstrated deviations from rational choice theory are not irrational demonstrates more of an agreement than a disagreement with the behavioralist agenda. *See* Christine Jolls et al., *Theories and Tropes: A Reply to Posner and Kelman*, 50 STAN. L. REV. 1593, 1594 (1998).

choice theory and supplement the inadequate elements in order to create a tool with more predictive power in specific situations.[79]

If lightly specified, thin versions of rational choice theory are inadequate tools for legal policymakers because they make too few predictions, and more fully specified, thick versions of the theory provide more satisfying predictions but these predictions are often incorrect, the obvious question is how can theorists take steps to solve one problem without substantially worsening the other? The answer, we believe, is to enhance rational choice theory by developing a more subtle, textured understanding of how actors make decisions in various situations, relying extensively on empirical data. The end point of this broad research agenda will likely not be a single unified theory designed to explain or predict the full realm of human decision-making behavior. Rather, it is more likely to be a pragmatic collection of situation-specific insights that can assist policymakers dealing with relevant problems. What the law-and-behavioral-science approach gives up in parsimony and universality, relative to rational choice theory, will be compensated for by its increased usefulness in the task of developing situation-specific legal policy.

II

BOUNDED RATIONALITY AND THE USE OF HEURISTICS

Whereas both thin and thick versions of rational choice theory presume that individuals act so as to maximize their expected utility, research in decision making, along with common experience, suggests that this prediction fails in many circumstances. "Bounded rationality," the term coined by Herbert Simon,[80] captures the insight that actors often take short cuts in making decisions that frequently result in choices that fail to satisfy the utility-maximization prediction.

Actors may make boundedly rational decisions for two somewhat different reasons. In some cases, actors faced with a decision might aim to make a satisfactory choice—one that meets a specified aspiration level—rather than one that maximizes their utility. For the decision maker, such intentional "satisficing"[81] behavior is often quite sensible in light of both the costs of obtaining and processing the information necessary to make

79. Thus, we do not necessarily disagree with Richard Posner's contention that the "major fruit of behavioral economics will be the stimulus it provides to new and better rational-choice theorizing," Posner, *supra* note 20, at 1567, although we think it is questionable whether a significantly expanded and nuanced approach to "rational-choice theorizing" would still be appropriately labeled "rational choice theory."

80. Herbert A. Simon, *Rational Choice and the Structure of the Environment, in* MODELS OF MAN: SOCIAL AND RATIONAL 261, 270-71 (1957) ("Since the organism . . . has neither the senses nor the wits to discover an 'optimal' path . . . we are concerned only with finding a choice mechanism that will lead it to pursue a 'satisficing' path, a path that will permit satisfaction at some specified level of all its needs.").

81. This term was coined by Herbert Simon. *See id.*

maximizing choices and the cognitive limitations of human beings that often render utility-maximization physically impossible. In other words, we might say that satisficing behavior can be rational in a "global" sense. Or, fitting it into the rational choice framework, we might say that the costs of processing information, or those imposed by cognitive limitations, create a constraint on maximizing behavior—just as income and time impose constraints on the feasible set of choices. One might then explore the systematic variations in maximizing behavior that might result from these constraints and make testable predictions about behavior in light of these variations. Despite the fact that satisficing behavior might be trimmed so as to fit within the rational choice framework, it nonetheless violates both thin and thick versions of rational choice theory, at least as they are usually implicitly understood in legal (and nonlegal) scholarship.[82] This is because satisficing causes actors to fail to maximize their utility in the particular decision-making situation at hand.

In other circumstances, boundedly rational decision making is an unintentional consequence of an unconscious use of heuristics in judgment and decision-making tasks. The widespread use of heuristics, at least in many cases, is no doubt a quite useful evolutionary adaptation; without such mental shortcuts, the task of making even relatively simple decisions would become so complex that daily life would almost certainly grind to a halt. But the use of heuristics surely results in the widespread failure of decision makers to maximize their expected utility in particular decision situations.[83] This Part reviews a variety of causes of boundedly rational decision making and discusses their significance for the analysis of legal rules.

A. Decision-Making Strategies that Do Not Maximize Expected Utility

Common experience suggests that there are some decisions that severely tax our capabilities or that seem impervious to our attempts to reduce them to manageable dimensions. In this section we consider two aspects of decision making—complexity and ambiguity—that lead most humans to make choices that do not maximize expected utility.

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82. *Cf.* Blaug, *supra* note 3, at 11 (observing that game theorists are "exclusively concerned" with how actors will behave with perfect information and unbounded calculating abilities rather than how they will behave in the face of imperfect information and limited cognitive abilities).

83. There is, however, disagreement within the judgment and decision-making community as to how close (or how distant) oft-used heuristics can come to approximating utility maximization. *See, e.g.*, Gerd Gigerenzer & Daniel G. Goldstein, *Reasoning the Fast and Frugal Way: Models of Bounded Rationality*, 103 PSYCHOL. REV. 650, 662 (1996) (arguing that decision-making heuristics often lead to performance in real world tasks that approaches the performance of "rational" decision-making approaches).

1. Complexity

The limits of human cognitive ability make utility-maximizing behavior physically impossible in some situations. Herbert Simon illustrates the problem with the example of the game of chess.[84] From one perspective, chess is a simple and uninteresting game.[85] Players have a single, clearly specified goal (checkmate the opponent's king), and all possible moves are known to both players.[86] In theory, a player should be able to determine the optimal strategy to reach the goal by constructing a decision tree with branches for each possible move of each player, look to the bottom of the tree to find a branch that leads to checkmate, and follow the branch back up to the beginning of the tree.[87]

The problem is that while chess is simple in one sense, in that there is a relatively small number of pieces and their allowable moves on the board are fixed,[88] it is, in another sense, an extremely complicated game, in that there are approximately 10^{120} possible combinations of moves in a game.[89] In light of this complexity, when it is time for a chess player to make a move, he must by necessity concede his inability to select a move guaranteed to maximize his expected utility and instead adopt a more simplified decision-making strategy (what Simon calls a "stopping rule").[90]

Complexity beyond human cognitive capacity is a sufficient condition for an actor to substitute a simplified decision strategy for a complete expected utility calculation, but it is not a necessary condition. Even if a choice is not too complex for an actor to process physically, she might choose to limit her search for information or consideration of the decision short of reaching a utility-maximizing decision.[91] The decision to adopt a

84. *See* Herbert A. Simon, *Theories of Bounded Rationality, in* 2 MODELS OF BOUNDED RATIONALITY: BEHAVIORAL ECONOMICS AND BUSINESS ORGANIZATION 408 (1982).

85. The famous game theorists Von Neumann and Morgenstern said, "[I]f the theory of Chess were really fully known, there would be nothing left to play." JOHN VON NEUMANN & OSKAR MORGENSTERN, THEORY OF GAMES AND ECONOMIC BEHAVIOR 125 (3d ed. 1953).

86. In game theory terms, chess is a game of complete information. *See, e.g.*, Simon, *supra* note 84, at 416.

87. Game theorists call this problem-solving strategy "backwards induction." *See* BAIRD ET AL., *supra* note 2 (defining backwards induction as a "*solution concept* applicable to an *extensive form game* made up of *information sets* consisting of single *nodes*"); AVINASH K. DIXIT & BARRY J. NALEBUFF, THINKING STRATEGICALLY: THE COMPETITIVE EDGE IN BUSINESS, POLITICS, AND EVERYDAY LIFE 40-44 (1991) (explaining the theory and practical difficulties of applying such a theory to chess).

88. *Cf.* VON NEUMANN & MORGENSTERN, *supra* note 85, at 125 (noting that the triviality of chess provides no practical help to the player).

89. This figure assumes there are about thirty possible moves each turn and about forty total turns per game. *See* Simon, *supra* note 84, at 413.

90. *Id.* at 415. Chess tournaments force competitors to adopt a stopping rule by placing a time limit within which each competitor must make a move.

91. *See generally* JOHN W. PAYNE ET AL., THE ADAPTIVE DECISION MAKER (1993) (articulating a theory in which decision makers, while using a variety of different strategies, generally try to balance effort and accuracy).

simplified strategy might be sensible given the marginal benefits and costs of making an optimal decision relative to a satisfactory one; in other words, the decision not to maximize utility when solving a single problem might in fact maximize the actor's overall utility.[92] But although a decision not to optimize in a particular situation might be globally "rational," such behavior is rarely contemplated by scholars employing rational choice theory in the analysis of a particular decision.

Decision researchers have identified the complexity of a decision as a leading cause of departures from the type of complete cost-benefit analysis of decision options predicted by expected utility theory. Acting consistently with expected utility theory requires a substantial amount of cognitive effort. As the problem becomes more complex, either because there are more options from which to select or because each option has more attributes associated with it,[93] actors might attempt to minimize effort by adopting simplified strategies, thus violating the procedural predictions of rational choice theory.[94] For example, one study found that experimental subjects were less likely to select a house that maximized their utility (defined by questions the subjects were earlier asked about their preferences) from among five alternatives as the number of attributes presented to the subjects was increased beyond ten.[95]

Decision theorists have suggested a number of decision-making approaches that actors employ in certain situations and that fall short of maximizing the expected utility of a particular decision. The difference between satisficing and optimizing, as Melvin Eisenberg puts the point, is the difference between searching for the sharpest needle in the haystack and searching for a needle that is sharp enough for sewing.[96] To pursue the chess example, a player might satisfice in his choice of moves by selecting the first move that places one of the opponent's pieces in jeopardy. It should be clear that this strategy may not maximize the player's expected utility (assuming his goal is to win the game), because a move that fails to place the opponent's pieces in immediate danger might place the player in a more advantageous position in the long run.

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92. Recall our example of Buridan's ass, see *supra* text accompanying note 54. The ass might be said to have starved because he searched for a global optimum rather than merely satisficing by choosing a local optimum.

93. *See* James R. Bettman et al., *Constructive Consumer Choice Processes*, 25 J. CONSUMER RES. 187, 189 (1998).

94. *See, e.g., id.* at 192 (noting that actors must compromise between their desires to make optimal decisions and to minimize effort); Peter Wright, *Consumer Choice Strategies: Simplifying vs. Optimizing*, 12 J. MARKETING RES. 60, 62 (1975) (noting that actors must "compromise between optimizing . . . and reducing the strains of decision making").

95. See Naresh K. Malhotra, *Information Load and Consumer Decision Making*, 8 J. CONSUMER RES. 419, 422-23 & tbl.1 (1982).

96. Melvin Aron Eisenberg, *The Limits of Cognition and the Limits of Contract*, 47 STAN. L. REV. 211, 214 (1995).

Using the more formal "lexicographic" decision-making strategy, an actor identifies the attribute of each of her decision choices that is the most important and selects the alternative with the highest value on that attribute.[97] For example, a restaurant patron might select the cheapest entree, or she might select the entree she thinks will taste the best. Notice that this strategy might cause the actor to select a choice with a lower expected value than a competing choice, for example, if the former ranked slightly higher than the latter on the most important attribute but the latter was superior to the former on several other attributes, or if the latter was substantially superior to the former on even a single less important attribute. More simply, lexicographic choice is inconsistent with expected utility theory because the actor violates the principle of commensurability—the high scores that the optimal decision choice achieves on attributes other than the most important one are not directly compared to the high score that the suboptimal decision choice achieves on the most important attribute.[98]

"Elimination by aspects" (EBA) combines features of the "satisficing" and "lexicographic" strategies. This approach calls for the actor to examine how alternatives rate on the most important attribute and eliminate from consideration all alternatives that do not meet a threshold level of value on that attribute.[99] If only one choice remains, the actor selects it. If more than one choice remains (or no choices), the actor selects the next most desirable attribute, and continues the pattern until a single choice remains.[100] For example, our restaurant patron might decide that price is the most important to her, and thus exclude all choices that cost more than $10. Then, within the choices that remain, she might select the entree she believes will taste the best. Like the "lexicographic" approach, EBA violates the commensurability principle, meaning that its use will often lead to choices that do not maximize the actor's expected utility.

In any given choice situation, actors might use a nearly infinite number of decision-making strategies that deviate from the predictions of expected utility theory. In a leading book on individual decision strategies, the authors conclude from a wealth of empirical evidence that actors are more likely to combine elements of different strategies than to use a "pure"

97. *See* Bettman et al., *supra* note 93, at 190.

98. Consider the following illustrative example: In one study, researchers asked experimental subjects to list factors that would be relevant to selecting a cancer treatment (for example, cost, likelihood of survival, and so on) and then describe how they would go about choosing between alternatives with different scores on these different attributes. *See* Barbara E. Kahn & Jonathan Baron, *An Exploratory Study of Choice Rules Favored for High-Stakes Decisions*, 4 J. CONSUMER PSYCHOL. 305, 312 (1995). Approximately one-third of subjects reported that they would select the approach with the highest value on the most important attribute (that is, they would use a lexicographic strategy). *See id.*

99. *See* Bettman, et. al. *supra* note 93, at 190.

100. *See id.*

strategy.[101] For example, a chess player might examine every legal move he could make and every possible response to that move, and then determine which choice will leave him in the best position after he moves and his opponent responds. This strategy is, of course, not globally optimal, because being in what appears to be the strongest position after any single move does not necessarily maximize a player's likelihood of checkmating his opponent. It can be viewed, instead, as settling for a local optimum, or, in other words, a very approximate optimization. Similarly, a player might initially select a few possible moves and attempt to follow the impact that each would have (making certain assumptions about how the opponent will make decisions) as many moves into the future as possible, and select the move that would appear to leave him in the strongest position at the end of the string. There is some evidence that most chess players are considerably less methodical than either of these imperfect options and that they instead search potential moves until they find one that meets a minimum satisfactory condition and then choose that move.[102] Regardless of the method a player uses for limiting his exploration of options, it is certain that even the best chess players can evaluate only a small number of moves relative to the total number of possible combinations.[103]

One important area in which complexity and ambiguity undermine the policy prescriptions of traditional law-and-economics analysis is contract law. Law and economics posits that the law should enforce all agreements between informed and competent private parties, assuming that the agreement has no (or relatively low) externalities that cause harm to third parties.[104] This theory of contract law is firmly rooted in the expected utility version of rational choice theory. If all parties wish to enter into an enforceable agreement, each must have determined that the benefits of being party to the contract outweigh its costs, and that its utility will be higher if the contract is enforced than if it is not. In addition, if a different bargain

101. *See* PAYNE ET AL., *supra* note 91, at 28-29.

102. *See id.* (citing De Groot, 65).

103. Precisely because human computational abilities are limited but those of computers are not, it has long been thought that an appropriately programmed computer could beat even the best human in a game of chess. Indeed, that happened in February, 1996, when in Philadelphia the IBM program "Deep Blue" defeated the world chess champion, Gary Kasparov, in a series of games. *See* Bruce Weber, *In Upset, Computer Beats Chess Champion,* N.Y. TIMES, Feb. 11, 1996, at A32; *see also NT server from Siemens challenges the world's fastest chess player, Viswanathan Anand,* M2 Presswire, June 9, 1998 (1998 WL 12973670) (reporting plans for the program "Fritz," which beat "Deep Blue" at the last world chess championship in 1995, to challenge Anand, the world's number two-ranked player, at the Frankfurt Chess Classic 98). Of course, not every decision that human beings must make is as complex as planning a chess move. But we believe that the complexities of our chess example pervade many human decision-making tasks, and probably most that interest legal scholars.

104. *See, e.g.*, COOTER & ULEN, *supra* note 8, at 207-09; *see also* Melvin Aron Eisenberg, *The Bargain Principle and Its Limits,* 95 HARV. L. REV. 741 (1982). An "externality" is an unbargained-for cost or benefit that the utility- or profit-maximizing activities of one person impose on others. Second-hand smoke and water pollution are examples.

would have increased the combined utility of the parties, it is assumed that the parties would have adopted different contractual terms. Consequently, the agreed-upon terms must maximize the parties' joint expected utility. If the goal of contract law is to help parties maximize the joint utility of their agreements, the traditional law-and-economics theory needs to be modified in situations in which complexity and ambiguity create substantial barriers to optimizing behavior.[105]

Consider the following timely policy issue: in the 1990s, thousands of laws were introduced in state legislatures[106] (and hundreds enacted[107]) that would mandate certain terms of contracts between health insurance providers and their customers. Many of these laws took the form of requiring that all insurance providers must include in their policies coverage for specific treatments under certain conditions. For instance, in response to constituent anger at "drive through deliveries," at least forty-one states,[108] along with the federal government,[109] have legislated a higher minimum coverage for postnatal hospital stays than most health maintenance organizations were theretofore willing to provide. Expected utility theory suggests that such state interference with private contracts would encourage an inefficiently large amount of resources to be devoted to medical care. If health insurance consumers make optimal cost-benefit tradeoffs, insurance providers would have a market incentive to provide enhanced maternity benefits if customers were willing to pay the higher premiums necessary to cover the marginal cost of such benefits. The absence of such coverage in many or all insurance agreements is evidence that consumers do not wish to pay for it.[110] According to expected utility theory, it follows that laws mandating the provision of specific maternity benefits create an inefficient allocation of social resources.

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105. The role that contract law can play in facilitating these transactions is to allow the parties to save on the transaction costs of concluding bargains or gifts by providing default and mandatory terms that, among other things, alert the parties to the pitfalls of fraud, strategic behavior, asymmetric information, and other sources of bargain frustration. *See* COOTER & ULEN, *supra* note 8, at 199-04, 207-12.

106. *See* Thomas Bodenheimer, *The HMO Backlash - Righteous or Reactionary?*, 335 NEW ENG. J. MED. 1601, 1601 (1996) ("In 1996 alone, 1,000 pieces of legislation attempting to regulate or weaken HMOs were introduced in state legislatures . . . ."); Families U.S.A., *HMO Consumers at Risk, States to the Rescue* (visited Mar. 16, 2000) <http://www.familiesusa.org> (noting that more than 1,000 managed care bills were introduced in 1995).

107. *See* Families U.S.A., *Hit & Miss: State Managed Care Laws* (visited Mar. 16, 2000) <http://www.familiesusa.org> (asserting that 49 states had enacted at least 1 of 13 managed care patient protection laws that the report studied).

108. *See* Molly Stauffer, *Inpatient Care After Childbirth*, National Council of State Legislatures-Health Policy Tracking Service, ISSUE BRIEFS, 1997 Annual Edition, Dec. 31, 1997.

109. *See* Newborns' and Mothers' Health Protection Act of 1996, Pub. L. No. 104-204, 110 Stat. 2935 (1996).

110. For a succinct version of this argument, see Patricia M. Danzon, *Tort Liability: A Minefield for Managed Care?*, 26 J. LEGAL STUD. 491 (1997).

The complexity of the health care choices that consumers (or their employers[111]) must make among competing insurance products, however, renders this efficiency conclusion problematic. The possible permutations of coverages that could, in principle, be provided by a given health insurance policy are numerous, and the features of each policy that are actually described in advertising and promotional materials can overwhelm even sophisticated consumers. As a result, it is highly unlikely that consumers, or even agents of consumers who might be making purchasing decisions, will carefully analyze and compare every feature of the competing policies in a way that would maximize the utility of their purchase decision. It is far more likely that, to reduce cognitive effort, consumers will use a simplified decision-making strategy when choosing between competing health insurance plans. If this is the case, the unregulated market will not necessarily provide health insurance customers with the efficient level of coverage.[112]

Under quite plausible assumptions of boundedly rational consumer choice in a very complex decision-making task, mandated benefit terms could actually increase the efficiency of insurance contracts by requiring insurers to sell coverages that consumers are willing to pay for but are not likely to insist upon through market behavior.[113] Whether or not policymakers who wish to promote the efficient allocation of resources should favor such benefit mandates will ultimately depend on the level of confidence they have in the ability of governmental bodies to identify which contract terms are inefficiently absent from most insurance contracts and which terms are efficiently absent. But policymakers are better served by predictions about how health care consumers are likely to make purchasing decisions that are more plausible than rational choice theory is able to provide.

The policy relevance of evidence that actors substitute simplified decision strategies for the full cost-benefit analysis posited by expected utility theory can be generalized from the example of managed care regulation. In any situation in which decisions are extremely complex relative to the value of the resources involved or to the capacities of those making the choice, decision makers are likely to make choices that fail to maximize their expected utility. If efficiency is the goal of the legal policy at issue, policymakers should at least consider whether government intervention in

111. Approximately 90% of privately insured Americans receive their health coverage through their employers, *see* Melinda L. Schriver & Grace-Marie Arnett, *Uninsured Rates Rise Dramatically in States with Strictest Health Insurance Regulations*, HERITAGE FOUNDATION REP., Aug. 1998, at 8-9 & tbl.2, and employers pay roughly 80% of the costs of private health insurance. *See* Katherine R. Levit et al., *National Health Spending Trends in 1996*, 17 HEALTH AFFAIRS 35, 46 (ex. 6) (1998). Approximately 48% of employees are offered a single health plan (no choice) by their employers. *See* Lynn Etheredge et al., *What is Driving Health System Change?*, 15 HEALTH AFFAIRS 93, 94 (1996).

112. *See* Russell Korobkin, *The Efficiency of Managed Care "Patient Protection" Laws: Incomplete Contracts, Bounded Rationality, and Market Failure*, 85 CORNELL L. REV. 1 (1999).

113. For a more detailed version of this argument, see *id.* at 62-74.

the market can be used to enhance the efficient allocation of social resources.

2. Ambiguity

In addition to complexity, ambiguity concerning the consequences of decision alternatives can necessitate suboptimal decision making from the perspective of expected utility theory. Ambiguity arises in two very different types of situation, only one of which is troubling for rational choice theory. In the first situation, the actor does not know what outcome will result from his possible choices, but he knows the possible distribution of outcomes. Consider, for example, an actor who will win $100 if he correctly calls a coin flip and lose $100 if he incorrectly calls it. In this circumstance, the value of choosing heads is uncertain, but the probability of each result, given the choice of heads, is known precisely. Ambiguity of this sort does not prevent the actor from making choices that maximize his expected ntility.[114]

The second and troubling type of ambiguity that decision makers often face is ambiguity concerning the content of decision alternatives. Consider, for example, the purchaser of home insurance who must decide whether to pay an additional annual sum for a rider that would protect him in case of earthquake damage. If the purchaser could estimate the probability that an earthquake will destroy his home, he could maximize his utility by comparing the cost of the added insurance to the expected benefit it would provide. But if the purchaser can neither estimate the likelihood of earthquake damage nor obtain information that would allow him to do so, it becomes impossible for him to make the type of optimizing decision that rational choice theory predicts.[115]

The implications of the ambiguity problem can be seen through another feature of contract law that runs contrary to the free market bias of rational choice theory: the rule regarding stipulated damages clauses. Hornbook contract law provides that contractual provisions requiring specified liquidated damages in the case of a breach of contract are unenforceable unless it is difficult for actual damages to be ascertained and the specified damages are a reasonable approximation of actual damages.[116]

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114. Expected utility theory, see *supra* Part I.A.2, explains how one ought to take account of this ambiguity. We know that the expected value of the bet, assuming the coin to be a fair one, is 0.5 ($100) + 0.5 (-$100) = 0. The individual can, by presumption, compute the expected utility of these outcomes in order to compare this alternative to others. We consider evidence that actors often fail to assess probabilities accurately in Part III.B ("Heuristics and Biases"), *infra*.

115. In addition to the effect cited, it appears that individuals dislike ambiguity, preferring a precisely understood probability to an uncertain probability of equal expected value. Thus, "people would rather face a known chance of an adverse consequence of 2/1,000 rather than a 50/50 chance that the risk is either 1/1,000 or 3/1,000." Viscusi, *supra* note 44, at 331.

116. *See, e.g.*, Lake River Corp. v. Carborundum Co., 769 F.2d 1284 (7th Cir. 1985); Board of Trustees v. Johnson, 507 So. 2d 887 (Miss. 1987); Robbins v. Finlay, 645 P.2d 623 (Utah 1982); E.

This rule provokes consternation from devotees of rational choice theory, who assume that competent parties would never agree to a stipulated damages term, no matter how one-sided it may appear to a third party, unless it made both signatories better off and maximized their joint utility.[117]

As Melvin Eisenberg has observed, however, specifying liquidated damages for breach of contract is often made quite difficult by ambiguity problems. In many (but certainly not all) contractual situations, the type and extent of damages that one party will suffer in the event of a breach is difficult to predict. Often, parties will not even be able to anticipate certain possible damages scenarios, making a reasonable prediction about the likelihood of such scenarios impossible. The consequence is that liquidated damages provisions, to the extent that parties intend them to serve as a proxy for expected actual damages, are likely to be quite erratic.[118]

The policy implication of this observation, according to Eisenberg, is that it is proper for courts to refuse to enforce stipulated damages provisions that diverge widely from actual damages suffered in the event of breach.[119] We are less sanguine about this conclusion, because it implicitly assumes that parties are better served by accuracy in damages assessments than by *ex ante* certainty as to what damages will be if a breach occurs—a proposition that is open to debate. But regardless of the ultimately "correct" stipulated damages rule, we think sound policymaking can only be enhanced by the subtlety of Eisenberg's analysis of bounded rationality in this particular context, as compared to the more elegant but less realistic predictions of rational choice theory.

B. Decision-Making Heuristics and Biases

In a world in which the consequences of most decisions are, to some degree, uncertain, actors can maximize the expected utility of a given decision only if their judgments are based on accurate perceptions of the likelihood that specific choices will lead to various possible outcomes.[120] To take a simple example, consider an actor offered a gamble in which he will receive $10 if a coin toss comes up heads, and he will lose $15 if the toss comes up tails. The actor will maximize his expected utility by declining the gamble, but he is certain to make this utility-maximizing decision only if he knows that there is a 50% probability that a fair coin will turn up

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ALLAN FARNSWORTH, FARNSWORTH ON CONTRACTS 939 (2d ed. 1990) (stating the general principle that liquidated damages provision sustained when loss resulting from breach will be "uncertain in amount and difficult to prove").

117. *See, e.g.*, COOTER & ULEN, *supra* note 8, at 235-37.

118. *See* Eisenberg, *supra* note 96, at 227-28.

119. *See id.* at 230.

120. *Cf.* Matthew Rabin, *Psychology and Economics*, 36 J. ECON. LITERATURE 11, 24 (1998) (noting that "[e]conomists traditionally have assumed that, when faced with uncertainty, people correctly form their subjective probabilistic assessments according to the laws of probability").

heads. If the actor mistakenly believes that the probability that the toss will come up heads is 66%, he might accept the gamble, thus failing to maximize his expected utility.

Research in the behavioral sciences has demonstrated that individuals are systematically biased in their predictions of the probable results of various events. This line of research, pioneered by psychologists Amos Tversky and Daniel Kahneman,[121] does not necessarily lead to the conclusion that individuals are "bad" decision makers. Often, systematic errors arise from the use of decision-making heuristics that simplify decision-making tasks, thus significantly reducing the costs of information processing and decision making, thereby rendering it possible to operate in an increasingly complex world.[122] In some cases, systematic decision-making errors might be the result of perceptual biases that may be, on balance, evolutionarily adaptive.[123] But whether or not the well-documented collection of heuristics and biases are rational adaptations in a global sense, they have the consequence of causing actors to make decisions that violate the predictions of rational choice theory in individual circumstances. This section both reviews the evidence of these failures of rational choice theory and considers their implications for the analysis of legal rules.

1. Availability and Representativeness

To accurately predict the probability of future events, actors must consider the statistical probability that an event will occur and "update" (adjust) this "base rate" with any available particularized information about a specific situation.[124] There is significant evidence, however, that actors systematically underuse base rates when making probability predictions, or ignore them altogether. Two related phenomena—the "representativeness heuristic" and the "availability heuristic"[125]—describe the ways in which actors often err in making these predictions.

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121. For an analysis of the broad impact of the work of Tversky and Kahneman, see David Laibson & Richard Zeckhauser, *Amos Tversky and the Ascent of Behavioral Economics*, 16 J. RISK & UNCERTAINTY 7 (1998).

122. *See* Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCIENCE 1124, 1124 (1974).

123. *See, e.g.*, THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE (Jerome H. Barkow et al. eds., 1992); STEVEN PINKER, HOW THE MIND WORKS (1997).

124. This method of calculating probabilities is known as "Bayes' Law." ROBERT V. HOGG & ALLEN T. CRAIG, INTRODUCTION TO MATHEMATICAL STATISTICS 208-09 (3d ed. 1970) (showing that in application of the law, one "updates" a prior probability assessment with new information, in a manner defined by the law, in order to get a posterior probability estimate).

125. For a more detailed (but still brief) discussion of the representativeness and availability heuristics, see PLOUS, *supra* note 34, at 109-20 (representativeness); *id.* at 121-30 (availability). More detailed treatments are contained in JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 23-100 (Daniel Kahneman et al. eds., 1982) [hereinafter JUDGMENT UNDER UNCERTAINTY] (representativeness); *id.* at 163-210 (availability); Timur Kuran & Cass R. Sunstein, *Availability Cascades and Risk Regulation*, 51 STAN. L. REV. 683 (1999).

The "representativeness heuristic" refers to the tendency of actors to ignore base rates and overestimate the correlation between what something appears to be and what something actually is.[126] As an example of this tendency, consider the now-famous "bank teller" problem used by Tversky and Kahneman. Experimental subjects were given a description of a woman, Linda, with a number of characteristics that appeared representative of someone who is a feminist. Subjects were then asked whether it was more likely that Linda was (a) a bank teller or (b) a bank teller active in the feminist movement.[127] Nearly 90% of respondents chose b,[128] a choice that is logically impossible because every person described by choice b is also described by choice a, although the reverse is not true.[129] Subjects ignored the base rate (there are more bank tellers than feminist bank tellers) because the description of Linda appeared more "representative" of the latter than of the former.[130]

The pervasiveness of the representativeness heuristic can help justify a set of rules of evidence law frustrating to rational choice theory. The Federal Rules of Evidence provide that "character evidence" is inadmissible in a trial to prove the truth of the matter asserted, unless one

126. *See* Amos Tversky & Daniel Kahneman, *Judgments of and by Representativeness, in* JUDGMENT UNDER UNCERTAINTY, *supra* note 125, at 84.

127. *See id.* at 92-93.

128. *See id.* at 93.

129. More specifically, this is an example of the conjunction fallacy. The Conjunction Rule says, "The probability of some eveut A occurring cannot be less than the probability of A and some other event B both occurring." EDWARD STEIN, WITHOUT GOOD REASON: THE RATIONALITY DEBATE IN PHILOSOPHY AND COGNITIVE SCIENCE 6-7 (1996). As a further example, suppose that I tell you that there is a 50% chance that it will rain and be at least 70 degrees Fahrenheit tomorrow. What is the probability that it will rain tomorrow? It cannot be less than 50%.

130. Consider another famous example of how individuals often fail to adequately consider "base rates" when making probability predictions, provided by Kahneman and Tversky. Suppose that 85% of the cabs in town are green and 15% are blue. A cab is involved in a hit-and-run accident, but the victim did not see the color of the cab. An eyewitness says that the offendiug cab was blue. How much credence should we give to the eyewitness's account? Suppose that the court, in an attempt to probe the worthiness of the eyewitness, creates an experiment in which he is shown a number of cabs under exactly the same conditions as those prevailing at the time of the accident and that he gets the color of the eab correct 80% of the time. When asked, "What is the likelihood of the offending cab's being blue, given that the eyewitness said it was blue?", most people estimate it to be 80% likely. *See* Amos Tversky & Daniel Kahneman, *Evidential Impact of Base Rates, in* JUDGMENT UNDER UNCERTAINTY, *supra* note 125, at 151, 156-58. But that is wrong. In point of fact, the probability that the cab is blue, given that the witness says that it is blue, is only about 40%. To see why, suppose that the eye witness had been shown 100 cabs of which 85 were green and 15 were blue. Of the 85 green cabs, he would have correctly identified 80% of them, or 68, as being green, but he would have incorrectly identified 17 of the green cabs as being blue. Of the 15 blue cabs, he would have correctly identified 12 of them as blue, but he would have incorrectly identified 3 of the blue cabs as bcing green. All together he said that 29 of the cabs that he saw were blue (17 green cabs mistakenly identified as blue plus 12 blue cabs correctly identified). Of those 29, only 12 were actually blue. The probability that the offending cab was blue, given that the eyewitness said that it was blue, is 12/29 or approximately 40%. Because most people do not take account of the base rate in making probability estimates, they are prone to the sort of error of this example: here, they give twice as much credence to the eyewitness as they ought to.

of a series of exceptions to the rule applies.[131] For example, a prosecutor may not introduce evidence that a criminal defendant charged with murder has a previous record of conviction for armed robbery.[132] In most circumstances, a prosecutor cannot even introduce evidence that a defendant charged with murder has a previous murder conviction.[133]

Assuming that jurors seek to maximize the positive relationship between their verdict and a criminal defendant's guilt, this type of character evidence is quite useful in enabling jurors to maximize their utility. Armed robbers are more likely than the average person to commit a murder, so the character evidence is quite relevant. The rational juror should consider the base rate of murderers in the population (quite small) and update that probability with the information that the particular defendant has been convicted of armed robbery. Preventing the presentation of the character evidence reduces the likelihood that a rational juror will reach the appropriate conclusion about the defendant's guilt.

The law correctly excludes character evidence from consideration, however, if jurors are likely to ignore the base rate—that is, to ignore the fact that most armed robbers are not murderers—and base their conclusion about the defendant's guilt on whether or not specific features about him look like stereotypical features of a murderer. Using the representativeness heuristic, many jurors are likely to conclude that because the defendant has the appearance of a criminal (in that he has a felony conviction), he therefore must have committed the crime for which he is charged.

When actors overestimate the relevance of salient or memorable incidents at the expense of base rates, they employ the "availability heuristic."[134] This mental shortcut can often lead to estimates that approximate statistical probabilities, as memorable events can be memorable precisely because they are common.[135] Unfortunately for the sake of precision, however, memorable events can also be memorable for reasons having nothing to do with their general prevalence—for example, because they are vivid, well publicized, or more prevalent among a particular actor's friends and

131. FED. R. EVID. 404(a).

132. *See, e.g.*, 1 CHRISTOPHER B. MULLER & LAIRD C. KIRKPATRICK, FEDERAL EVIDENCE 536-37 (2d ed. 1994) ("[T]he basic rule of exclusion is of fundamental importance. It implements the philosophy that a defendant should not be convicted because he is an unsavory person, nor because of past misdeeds, but ouly because of his guilt of the particular crime charged.").

133. *See id.* at 539 n.1.

134. *See* Amos Tversky & Daniel Kahneman, *Availability: A Heuristic for Judging Frequency and Probability*, *in* JUDGMENT UNDER UNCERTAINTY, *supra* note 125, at 163, 164 ("A person is said to employ the availability heuristic whenever he estimates frequency or probability by the ease with which instances or associations could be brought to mind.").

135. Note that, so long as available incidents are representative of base rates, relying on available anecdotes rather than statistical probabilities will not lead to sub-optimal decision making. *See, e.g.*, Posner, *supra* note 69, at 1572 ("It is entirely rational for people to rely on anecdotal evidence in the absence of better evidence . . . .").

acquaintances. Actors often estimate these available events as being much more common than they actually are.

For example, most people believe that words beginning with the letter "k" are more prevalent than words in which "k" is the third letter, although the latter set of words is actually twice as large as the former.[136] Presumably, this is because it is easier to bring to mind words that begin with the letter "k" (such as "knave" and "kite") than those that have "k" as their third letter (such as "ark" and "ankle").[137] Similarly, most people believe that homicides and car accidents kill more Americans than diabetes and stomach cancer, presumably because of the greater media coverage provided to the former two, although the two diseases kill far more people.[138] Edward McCaffery hypothesizes that most states favor sales taxes over income and property taxes even though income and property taxes have a lower net cost to residents (they are deductible from federal income tax, while sales taxes are not) in part because the latter taxes are more prominent to taxpayers than are the former.[139]

That people are biased by availability can have a widespread impact on legal policy in a variety of specific situations. Consider the potential impact of the availability heuristic on the policy prescriptions that rational choice theory provides for deterring crime. According to conventional rational choice analysis, potential criminals maximize their utility by committing crimes only if the expected benefits exceed the expected costs.[140] The expected costs of crime are determined by multiplying the (monetized) severity of punishment by the likelihood that the criminal will be arrested and convicted.[141] If criminals are rational utility maximizers, society can deter crime by raising these expected costs above the expected benefits of crime. And society can achieve this end with equal success by increasing the severity of punishment or the frequency of arrest, conviction, and punishment. Because increasing severity (that is, lengthening jail terms or imposing monetary fines) is generally thought to be cheaper than increasing frequency (that is, increasing the number of police, prosecutors, and

136. *See* Tversky & Kahneman, *supra* note 134, at 166-68.

137. *See* Jolls et al., *supra* note 13, at 1518 (describing a study in which subjects guessed that there are more words ending with "ing" than words in which the second-to-last letter is "n").

138. *See* PLOUS, *supra* note 34, at 121-22.

139. *See* Edward J. McCaffery, *Cognitive Theory and Tax*, 41 UCLA L. REV. 1861, 1901-04 (1994).

140. *See, e.g.*, COOTER & ULEN, *supra* note 8, at 436-39; Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968); Steven Shavell, *Criminal Law and the Optimal Use of Nonmonetary Sanctions as a Deterrent*, 85 COLUM. L. REV. 1232, 1235 (1985).

141. *See* COOTER & ULEN, *supra* note 8, at 447 ("When the probability of punishment is multiplied by its severity, the result is the expected punishment.").

judges), it is generally assumed that increasing severity is the more efficient deterrence strategy.[142]

If criminals are biased by availability when calculating (no doubt in an informal sort of way) the anticipated costs of crime, this analysis could change radically depending on what types of events are more salient to potential criminals. In order to determine which deterrence mechanism will be most efficient, policymakers need to understand whether criminals are likely to over- or underestimate the frequency and the severity of punishment that is actually meted out. If punishments are so severe that some sentences become shocking and well publicized, increasing severity could be the more efficient deterrence strategy. Otherwise, increasing the frequency of punishment is likely to be more efficient, under the assumption that if a criminal knows or knows of someone who has been imprisoned for a particular crime, this information is likely to be available and to cause him to overestimate the likelihood that he will be arrested and convicted if he commits the same crime.

When allocating resources, policymakers should also be concerned with what types of law enforcement efforts are most available (that is, visible) to potential criminals. The sharp overall decline in crime in New York City in the 1990s is often credited to police crackdowns on "public order" offenses that are highly visible.[143] Such observable evidence of law enforcement activity might affect the cost-benefit calculations of would-be lawbreakers contemplating unrelated criminal acts by causing them to believe the frequency of apprehension is greater than it actually is.[144] The point, generally, is that criminals may not use objectively verifiable evidence of frequency and severity, as rational choice theory implicitly assumes that they do.[145]

The availability heuristic also sheds light on a long-running controversy in the medical community over the use of clinical practice guidelines, which, based on statistical evidence, instruct physicians on how to treat patients who exhibit particular sets of symptoms.[146] Defenders of

142. *See, e.g.*, POSNER, *supra* note 26, at 244; Dan M. Kahan, *Social Influence, Social Meaning, and Deterrence*, 83 VA. L. REV. 349, 351-52, 378 (1997) (calling this a "foundational insight of the standard ecouomic conception").

143. *See* Kahan, *supra* note 142, at 368-69.

144. *See, e.g.*, Robert J. Sampson & Jacqueline Cohen, *Deterrent Effects of the Police on Crime: A Replication and Theoretical Extension*, 22 L. & SOC'Y REV. 163 (1988) (finding that increased police attention to disorderly conduct offenses is correlated with a decrease in robbery rates).

145. There is empirical evidence that criminals systematically underestimate the likelihood of their being caught, convicted, and punished. *See, e.g.*, James Q. Wilson & Alan Abrahamse, *Does Crime Pay?*, 9 JUST. Q. 359, 373 tbl.10 (1992).

146. *See, e.g.*, Mark Kadzielski et al., *Peer Review and Practice Guidelines Under Health Care Reform*, 16 WHITTIER L. REV. 157, 158 (1995) (Proponents of guidelines argue that they reduce health care spending, serve as a basis for defining a basic package of health care benefits, protect physicians in malpractice litigation, help physicians and patients make better health care decisions, and increase the quality of patient care. Physicians, on the other hand, fear that guidelines will become rigid

decision-making autonomy in the medical profession often argue that doctors should be free to deviate from the prescriptions of such guidelines based on their clinical experience. After all, each patient is unique, and treatments specified in practice guidelines, derived from base rates of the effectiveness of various treatments, may not best serve every patient. Although this argument is hard to dispute in the abstract, the availability heuristic suggests that deviations from practice guidelines by individual doctors are more likely to be based on the experiences of the physician than on the unique characteristics of the patient. That is, a doctor who has successfully used an "alternative" treatment regime in the past and found it successful is highly likely to ignore the practice guidelines, although those guidelines, based on statistical evidence, will be effective more often than the vivid but anecdotal data derived from a particular physician's experience.

One policy implication of this might be for the legal system to privilege treatment that follows practice guidelines. As long as each human being is unique, deviations from practice guidelines will be desirable in some cases, so regulatory requirements that physicians adhere to such guidelines would likely be an unfortunate overreaction to the problem. But it might be sensible to require physicians who deviate from guidelines to document their reasons for doing so, thus ensuring that such deviations are at least carefully considered. Alternatively, tort law could provide that adherence to practice guidelines by a physician creates a rebuttable presumption of nonnegligence in malpractice lawsuits or even an affirmative defense to a charge of malpractice.

Finally, an understanding of the availability heuristic can provide a caution to policymakers tempted to enact new regulatory regimes in response to highly available information concerning health or safety risks. Jolls, Sunstein, and Thaler argue persuasively that the enactment of "Superfund" legislation in 1980 was largely a result of publicity concerning the coverage of environmental contamination in Love Canal, New York, beginning in 1978.[147] It is at least arguable that this attempt to solve the problem of toxic waste dumps diverted scarce public and congressional attention from far more dangerous and pervasive environmental health risks.

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standards used for reimbursement and for other legal purposes, will impede advances in new technology and will quickly become outdated. Physicians also criticize the fact that guidelines are developed by academics who have no real world experience in medicine.); *cf.* Thomas M. Burton, *An HMO Checks Up on its Doctors' Care and is Disturbed Itself*, WALL ST. J., July 8, 1998, at A1 (reporting that an HMO's internal audit found that doctors routinely fail to follow accepted clinical guidelines).

147. *See* Jolls et al., *supra* note 13, at 1520-22; *see also* Kuran & Sunstein, *supra* note 125, at 691-98 (arguing that the publicity surrounding Love Canal may have created an "availability error").

2. Overconfidence and Self-Serving Biases

Even when actors know the actual probability distribution of a particular event, their predictions as to the likelihood that that event will happen to them are susceptible to the "overconfidence bias": the belief that good things are more likely than average to happen to us and bad things are less likely than average to happen to us.[148] Demonstrating that a particular individual is overconfident is difficult to do, because the individual might well differ from the statistically average person in positive ways. For example, a student who believes he will score above the mean on an exam might be overconfident of his ability. On the other hand, he might be smarter or a more diligent studier than his peers, making the prediction quite reasonable. But the pervasiveness of the overconfidence bias has been demonstrated persuasively in experiments that elicit opinions from all members of a group about how they are likely to compare to other members of the group.[149] Notwithstanding Garrison Keillor's report, all the children in Lake Wobegon cannot really be above average.[150]

The overconfidence bias is well demonstrated by Neil Weinstein, who asked a sample of students at Rutgers University to estimate whether or not each of a series of events was more or less likely (and how much more or less likely) to happen to them than to their classmates.[151] Of eighteen positive events, ranging from owning their own home to avoiding a hospital stay during the next five years, the mean respondent estimated his chances to be greater than the average for his peers—that is, the other survey respondents—in fifteen of the events.[152] In contrast, subjects on average believed that negative events, ranging from suffering a divorce to losing a job to contracting lung cancer, were less likely to happen to them than to their peers in twenty-two of twenty-four events.[153] Similarly, in a survey of Virginia residents who applied for a marriage license, Baker and Emery found that, although most respondents knew that close to half of all marriages end in divorce, when asked to predict the likelihood that their marriage would end in divorce, the modal response was zero.[154]

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148. *See generally* Christine Jolls, *Behavioral Economics Analysis of Redistributive Legal Rules*, 51 VAND. L. REV. 1653, 1659 & n.22 (1998) (noting that nearly two hundred studies support this descriptive claim).

149. *See generally* sources cited in Neil D. Weinstein, *Unrealistic Optimism About Future Life Events*, 39 J. PERSONALITY & SOC. PSYCHOL. 806, 806 (1980).

150. GARRISON KEILLOR, LEAVING HOME xvii (1987) ("'That's the news from Lake Wobegon, where all the women are strong, the men are good-looking, and all the children are above average'....").

151. *See* Weinstein, *supra* note 149, at 809.

152. *See id.* at 810 tbl.1.

153. *See id.*

154. *See* Lynn A. Baker & Robert E. Emery, *When Every Relationship Is Above Average: Perceptions and Expectations of Divorce at the Time of Marriage*, 17 LAW & HUM. BEHAV. 439 (1993).

The overconfidence bias could have a wide-ranging impact on deterrence policy in a variety of areas of law. Policymakers rarely wish to deter 100% of even undesirable conduct, because the costs of doing so would likely be too great.[155] For any type of conduct that the state wishes to discourage, from criminal behavior to carelessness likely to lead to a tort, rational choice theory advises policymakers to set the penalty for the undesirable conduct such that the desired fraction of the population—say, potential injurers—will calculate that the expected costs of the conduct exceed the expected benefits to them. Where the targets of such policies exhibit overconfidence, however, policymakers will have to set the penalties higher, sometimes substantially so, than they would in a world of utility-maximizing actors who are not systematically overconfident. If bank robbers believe that they are less likely to be apprehended than their peers, if absentminded drivers believe they are less likely to cause an accident than other drivers, or if some physicians believe they are less likely to be found liable for malpractice than other physicians, penalties for the undesirable behavior will have to be higher than policymakers would otherwise think necessary to achieve the desired level of deterrence.[156]

For policymakers to be able to make effective use of the insights provided by the overconfidence bias, more empirical research needs to be done on which groups and in what situations overconfidence is likely to be most severe.[157] Currently, one useful conclusion can be drawn from the literature: at least for events perceived to be negative, actors apparently tend to be more overconfident when the event in question is perceived to be controllable than when it is perceived not to be controllable.[158] This finding suggests that an understanding of the overconfidence bias is, in fact,

155. *See* COOTER & ULEN, *supra* note 8, at 21-24 (demonstrating that social optimality occurs where social marginal benefit and social marginal cost are equal and that this rarely occurs at a zero quantity of a bad thing).

156. *See* Atul Gawande, *Why Doctors Make Mistakes*, THE NEW YORKER, February 1, 1999, at 40, 40-52 (arguing that most medical mistakes, even those by very good physicians, are simply oversights, and that exposure to malpractice liability does not have an additional precautionary effect on physicians).

157. One plausible, but as yet unproven, hypothesis is that older people are less overconfident than younger people. *See* RICHARD A. POSNER, AGING AND OLD AGE 104 (1995). Available data does suggest, however, that the bias is not limited to the young, who disproportionately serve as subjects in psychology experiments. *See, e.g.*, Andrew Guppy, *Subjective Probability of Accident and Apprehension in Relation to Self-Other Bias, Age, and Reported Behavior*, 25 ACCIDENT ANALYSIS & PREVENTION 375, 377-78 & tbl.1 (1993); Neil D. Weinstein, *Unrealistic Optimism About Susceptibility to Health Problems: Conclusions from a Community-Wide Sample*, 10 J. BEHAV. MED. 481, 487-89 (1987).

158. *See* Weinstein, *supra* note 149, at 814. Weinstein concluded that, when subjects perceived an event to be controllable, they tended to compare themselves with the stereotypical victim of the negative event, leading to overconfident predictions. In contrast, when events were perceived as uncontrollable, subjects did not perceive a stereotype of a victim with whom to compare themselves. *See id.*

particularly necessary to develop optimal deterrence policies, since such policies are targeted at controllable events.

Related to the overconfidence bias is the "confirmatory" or "self-serving" bias, the term to describe the observation that actors often interpret information in ways that serve their interests or preconceived notions. For example, Lord and his colleagues found that when experimental subjects were given factual evidence about the effects of the death penalty, subjects identified as proponents of capital punishment said the evidence reinforced their prior beliefs, while subjects identified as opponents of capital punishment said that the information reinforced their prior beliefs.[159]

In a series of papers, Loewenstein and his colleagues[160] and Babcock and her colleagues[161] found a similar effect of information in the litigation context.[162] A group of law student subjects were provided with factual information about a dispute in litigation. Despite being given identical information, subjects who were told to imagine that they were the attorney representing the plaintiff interpreted the facts as favorable to the plaintiff, while subjects told to imagine that they were the attorney representing the defendant interpreted the facts as favorable to the defendant.[163]

The conventional law-and-economics approach to trial and settlement, based on rational choice theory, predicts that, because trials are more costly than out-of-court settlement, lawsuits will settle out of court unless the parties have substantially different predictions about the likely results of trial.[164] Plaintiffs and defendants may reach different predictions about the likely outcome of a trial, but differences in predictions are presumed to be in both directions—that is, where the predictions of plaintiffs and defendants diverge, half of the time plaintiffs will believe their prospects are

159. See Charles G. Lord et al., *Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence*, 37 J. PERSONALITY & SOC. PSYCHOL. 2098, 2102 (1979).

160. *See generally* George Loewenstein et al, *Self-Serving Assessments of Fairness and Pretrial Bargaining*, 22 J. LEGAL STUD. 135 (1993).

161. *See generally* Linda Babcock et al., *Biased Judgments of Fairness in Bargaining*, 85 AM. ECON. REV. 1337 (1995) [hereinafter Babcock et al., *Biased Judgments*]; *see also* Linda Babcock et al., *Choosing the Wrong Pond: Social Comparisons in Negotiations that Reflect a Self-Serving Bias*, 111 Q. J. ECON. 1 (1996) [hereinafter Babcock et al., *Choosing the Wrong Pond*].

162. *See also* Jolls et al., *supra* note 13, at 1503 (discussing the Loewenstein and Babcock studies).

163. *See* Loewenstein et al., *supra* note 160, at 151-52; Babcock et al., *Biased Judgments*, *supra* note 161, at 1340. Investigators have identified a closely related effect called "cognitive dissonance." This is a form of selective perception in which actors give greater weight to evidence that confirms beliefs they already hold and lesser weight to contradictory evidence. *See* LEON FESTINGER, A THEORY OF COGNITIVE DISSONANCE (1957); PLOUS, *supra* note 34, at 22-30.

164. *See* COOTER & ULEN, *supra* note 8, at 377-84 and 390-94; George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 12 (1984). For an excellent review of the literature, see Robert D. Cooter & Daniel Rubinfeld, *Economic Analysis of Legal Disputes and Their Resolution*, 3 J. ECON. LITERATURE 1067 (1989).

worse than defendants anticipate.[165] An implication of this conventional account is that because litigation will be less likely when the parties have more accurate estimates of the likelihood of prevailing, anything that improves those estimates, such as expanded pretrial discovery or better legal representation, is to be favored.

Evidence of the self-serving bias in the analysis of lawsuits suggests, in contrast, that plaintiffs (and defendants) will systematically anticipate their trial prospects as being better than defendants (and plaintiffs) believe. The consequence of this is more trials than would be predicted by the rational choice model, unless steps are taken to mitigate the parties' evaluative biases. More information—provided, perhaps, in the form of expanded pretrial discovery—is unlikely to be effective because, as we have seen in the experiments cited above concerning the death penalty controversy,[166] people seem to use additional evidence to solidify their views, rather than to alter them.

Although the policy implications of this are not obvious, a strong case can be made that evidence of the self-serving bias provides support for legal structures that require litigating parties to view the facts of a dispute through the eyes of their opponents. The modern trend in civil litigation toward mandatory settlement conferences,[167] court-ordered mediation,[168] and nonbinding arbitration[169] make little sense from a rational choice perspective, under which parties are presumed to make (accurate) maximizing decisions about whether to settle or even whether to negotiate with their adversaries. In a rational choice world, mandated interaction would merely increase transaction costs for no useful purpose. But these requirements seem quite defensible if the self-serving bias is present and pervasive.

The implications of self-serving bias for reexamining conventional law-and-economics wisdom of legal rules potentially carries far beyond the realm of litigation versus settlement. For example, the law-and-economics theory of property law is based largely on the assumption of the Coase Theorem that property rights will be traded when the holder of such a right

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165. *See* Priest & Klein, *supra* note 164, at 10-11 & fig.3; Babcock et al., *Biased Judgments*, *supra* note 161, at 1337.

166. *See supra* note 159 and accompanying text.

167. *See, e.g.*, FLA. STAT. ANN. § 766.108 (West 1987) (requiring a mandatory settlement conference in all medical malpractice actions); CAL. R. CT. 222 (West 1996) (requiring a mandatory settlement confcrence in all "long cause matters"); HAW. ST. USDCT CIV., RULE 235 (Michie 1995) (requiring a mandatory settlement conference in every civil action); MICH. RULE 3 CIR., RULE 2.401 (West 1998) (requiring a mandatory settlement conference in all civil actions).

168. *See, e.g.*, U.S. DIST. CT. RULES E.D. PA., CIVIL RULE 53.2.1 (West 1998) (ordering all odd-numbered cases to participate in an experimental mediation program).

169. *See, e.g.*, FLA. STAT. ANN. § 44.103 (1993) (allowing courts to refer certain civil actions to nonbinding arbitration); HAW. REV. STAT. § 601-20 (1998) (establishing a program of mandatory nonbinding arbitration for all civil matters under $150,000); NEV. REV. STAT. § 38.250 (1999) (requiring mandatory nonbinding arbitration for all civil actions under $40,000).

values it less than does another actor, assuming low transaction costs.[170] But the self-serving bias suggests that individuals are likely to estimate the value of property rights differently depending on which side of the transaction they find themselves. This could result in rights being more "sticky" (resistant to exchange) than rational choice theory would predict—a point to which we will return in a slightly different guise in our discussion of the "endowment effect" and the related "status quo bias."[171]

An additional example comes in the corporate context, where managers with undue confidence in their firms' ability to overcome obstacles and a self-serving perception of information that might objectively signal future problems could potentially mislead those who would invest in their firms' securities. Donald Langevoort has suggested that this likelihood provides a justification for securities law rules, such as "due diligence" requirements for lawyers and accountants under the Securities Act of 1933, that require third parties who are potentially less likely to suffer from such biases to verify the truthfulness of information that the firm provides to the marketplace.[172]

3. *Hindsight Bias*

Perhaps the most-studied shortcoming in probabilistic assessment is the "hindsight bias," the term that describes the tendency of actors to overestimate the *ex ante* prediction that they had concerning the likelihood of an event's occurrence after learning that it actually did occur.[173] In what is arguably the most famous of the many hindsight bias studies, Baruch Fischhoff gave five groups of subjects a passage to read describing the events leading up to a military confrontation between the British army and the Gurkas in Nepal in the nineteenth century and asked them, on the basis of that information alone, to specify the likelihood that four specified military outcomes would have resulted.[174] Each of four groups was told that a different outcome of the four specified outcomes actually occurred, while the fifth group (the control group) was given no information on the actual outcome.[175] Subjects in each of the groups to whom the investigators gave an outcome reported an *ex ante* prediction of that outcome that was considerably higher than the prediction for that outcome made by the subjects in

170. *See generally* Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960).

171. *See infra* Part III.B.

172. *See* Langevoort, *supra* note 64, at 158-59.

173. For a review of well over 100 studies of the hindsight bias, see Jay J.J. Christensen-Szalanski & Cynthia Fobian Willham, *The Hindsight Bias: A Meta-Analysis*, 48 ORG. BEHAV. & HUM. DECISION PROCESSES 147 (1991).

174. Baruch Fischhoff, *Hindsight ≠ Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*, 1 J. EXPERIMENTAL PSYCHOL.: HUM. PERCEPTION & PERFORMANCE 288, 289-90 (1975).

175. *See id.* at 289.

the control group.[176] In other words, information about what actually occurred apparently influences our judgments concerning what we thought would occur before we knew the outcome. Events that have actually occurred can seem, through the lens of hindsight, to have been almost inevitable.

Kamin and Rachlinski demonstrated the effect that the hindsight bias can have on the assignment of tort liability.[177] Using a fact pattern based on the famous case, *In re: Kinsman Transit Company*,[178] the experimenters asked a group of subjects to play the role of jurors and to determine whether a company operating a bridge had been negligent in its failure to take precautions that would have prevented flood damage to third parties. They instructed subjects to use the famous "Learned Hand formula"[179] to determine whether or not an act was negligent—that is, to assess liability only if the costs of precaution to the bridge company would have been less than the expected costs of flood damage to third parties (given the uncertainty of a flood's occurring) that would result from not taking the precaution.[180] While 57% of the juror subjects would have found the bridge company negligent under this standard, only 24% of subjects in a control condition, who had the same information except that the flood had in fact not occurred, believed that the cost of precaution would have been justified by the risks of not taking the precautions.[181] Traditional law and economics suggests that precaution is efficient when its benefits outweigh its costs and that tort law should impose liability for negligence when an actor fails to take efficient precaution but not when he fails to take inefficient precaution.[182] But if jurors are subject to the hindsight bias, defendants will be found negligent in situations in which they acted in a socially efficient manner (failed to take inefficient precautions) but were struck by bad luck.

176. *See id.* at 290. The experiment is discussed, among other places, in Rabin, *supra* note 120, at 30, and Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. CHI. L. REV. 571, 576 (1998).

177. *See* Kim A. Kamin & Jeffrey J. Rachlinski, *Ex Post ≠ Ex Ante: Determining Liability in Hindsight*, 19 LAW & HUM. BEHAV. 89 (1995); *see also* Susan J. LaBine & Gary LaBine, *Determinations of Negligence and the Hindsight Bias*, 20 LAW. & HUM. BEHAV. 501 (1996) (finding that a large minority of subjects playing the role of jurors would find a psychiatrist negligent for failing to prevent a patient's violence, even when the psychiatrist followed a widely approved standard of behavior and the violent act was unpredictable).

178. 338 F.2d 708 (2d Cir. 1964), *cert. denied*, 380 U.S. 944 (1965).

179. The formula was made famous in Judge Hand's opinion in *United States. v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947). "[I]n algebraic terms: if the probability be called P; the injury L; and the burden B; liability depends upon whether B is less than L multiplied by P: i.e., whether B is less than PL." *Id.* at 173.

180. *See* Kamin & Rachlinski, *supra* note 177, at 96.

181. *See id.* at 98.

182. *See, e.g.*, COOTER & ULEN, *supra* note 8, at 313-16; LANDES & POSNER, *supra* note 8, at 58-60; POSNER, *supra* note 26, at 180-83; SHAVELL, *supra* note 8, at 78.

This, in turn, could provide actors with a private incentive to take an inefficiently high amount of precaution.

As is true with many of the deviations from the predictions of rational choice theory, the legal implications of this behavioral phenomenon are not clear cut. If jury instructions could obviate the hindsight bias, such a strategy would clearly be appropriate in a variety of situations in which efficient deterrence requires jurors to impose liability based on *ex ante* judgments about the likelihood of certain events' occurring. Unfortunately, psychologists have yet to find a method of eliminating the hindsight bias, and even reducing its effect has proven quite difficult.[183]

Some analysts have suggested that the bias might be countered by raising the standard of proof necessary to find a defendant negligent—for example, from the existing "preponderance of the evidence" standard to one of "clear and convincing evidence."[184] Jeff Rachlinski has argued that this is one way to understand the business judgment rule in corporate law:[185] corporate officers and directors are held liable for, in effect, "negligently" operating their companies only when there is evidence of "gross negligence."[186] The problem with this approach, of course, is its lack of precision. If the hindsight bias is strong, raising the standard of proof might not eliminate overdeterrence. On the other hand, raising the standard of proof could swamp the bias, leading to underdeterrence. This might happen if the hindsight bias effect, in the event of litigation, is not so strong that liability is difficult to establish under the "clear and convincing evidence" standard and, as a result, potential injurers take fewer precautions than they ought to because the likelihood of being held liable has fallen significantly.

Jolls, Sunstein, and Thaler have suggested that the bias might be avoided by shielding juries from evidence concerning what action the defendant actually took until after jurors have determined what decision would have been reasonable *ex ante*.[187] To illustrate how this might work, the authors give the example of a food processing company that might have subjected its customers to contaminated food if it chose not to use a certain preservative and might have subjected them to carcinogenic chemicals if it chose to use the preservative. Jurors would then be asked to assess

183. *See* Rachlinski, *supra* note 176, at 603 (concluding that any procedure that might mitigate against the hindsight bias is "so intrusive [that it] may not be suitable for the courtroom").

184. *See id.* at 606; Jolls et al., *supra* note 13, at 1529-32.

185. *Cf.* Rachlinski, *supra* note 176, at 574 (suggesting that the business judgment rule can be viewed as a rule of "no liability," which might have fewer consequences than the alternative of negligence judged in hindsight).

186. *See, e.g.*, Aronson v. Lewis, 473 A.2d 805 (Del. 1984) (stating the "gross negligence" standard). Of course, there are other ways of justifying this rule. For instance, a standard argument is that shareholders would want managers to have wide discretion to run the company without having to face repeated challenges to their decisions on a close standard like "preponderance of the evidence."

187. *See* Jolls et al., *supra* note 13, at 1527-29.

the costs and benefits of using and not using the preservative, without knowing what choice the defendant made or the consequences of that choice.[188]

This is a creative solution, but it can work only in the limited number of cases in which it is plausible that both acting and not acting could subject the defendant to a lawsuit. But many, if not most, cases do not involve defendants who were forced to choose between potential torts. Rather, the choice most defendants face is whether or not to take a precaution that will reduce the risk of an accident or injury. In this type of case, hindsight bias will be unavoidable because it will be clear to jurors from the fact that a lawsuit has been filed and a jury impaneled that a particular type of accident occurred (or allegedly occurred). Therefore, as creative as the Jolls-Sunstein-Thaler proposal is, it does not seem practicable as a general solution to the problem that the hindsight bias creates in assessing negligence liability.

Instead, we believe that the presence of the hindsight bias argues for two other reforms of accident regulation, one within the realm of private tort law, the other within public law. The first is the wider use of strict liability and, consequently, a more restricted scope for negligence liability. The standard, rational-choice-based law-and-economics analysis of the selection of a liability standard focuses on two aspects of accidents: the technology of precaution and the relationship between the underlying risk-creating activity and the scope of harm. When the technology of precaution is bilateral (in the sense that both the potential victim and the potential injurer can take precautionary action that will reduce the probability or severity of an accident), then law and economics argues for the negligence standard.[189] When, in contrast, the technology of precaution is unilateral (in the sense that only the potential injurer can realistically take action to reduce the probability or severity of an accident), then strict liability is more efficient than negligence.[190] Finally, where, in addition to the precaution

188. *See id.* at 1527-28.

189. This argument is a good example of the thrust of rational choice theory in the economic analysis of law. A rational potential injurer will reason that, if complying with the due care standard is cheaper than expected liability costs, he should comply with the legal duty and thereby escape liability. A rational potential victim will reason that if she is injured in an accident, she will surely be injured by a rational injurer, who will, no doubt, have reasoned that he should comply with the legal duty of care and will therefore not be liable for the victim's losses. That means that the potential victim must bear her own losses in the event of an accident. Faced with this "residual liability," the rational potential victim will take as much care as necessary to minimize her expected costs arising from an accident. The argument also works when decision makers are not certain *ex ante* an accident whether they will be an injurer or a victim. The real insight of this way of thinking about the negligence standard is its recognition that the standard induces both parties, not just the potential injurer, to take care. See COOTER & ULEN, *supra* note 8, at 304-11 for a basic explanation and 338-45 for extensions of the basic theory.

190. There is no point in imposing residual liability on the potential victim if there is nothing that she can do to reduce the probability or severity of an accident. *See id.* at 272-75.

externality, there is a quantity externality or "activity level effect" (an independent effect that the level of the underlying risk-creating activity has on the likelihood of an accident—for example, the more miles one drives, the more likely an accident becomes), strict liability is superior to negligence.[191]

The pervasive evidence of the hindsight bias provides an additional pragmatic argument for selecting a strict liability standard. The hindsight bias casts doubt on the ability of juries to reach proper negligence determinations because juries are likely to believe precautions that could have been taken would have been more cost-effective than they actually appeared to be *ex ante*. But the bias presents no similar impediments to the ability of juries to reach proper liability determinations under a strict liability regime, where the jury need only determine that the alleged accident occurred and was caused by the defendant in order for liability to attach.

The second reform designed to overcome the problems of hindsight bias in adjudication is to downplay *ex post* adjudication as a method of minimizing the social costs of accidents in favor of broader *ex ante* regulation of safety by administrative agencies. Administrative regulation has, of course, a host of problems of its own: inflexibility, political pressures from well-organized interest groups, bureaucratic bumbling, and the like.[192] But, holding all other things constant, evidence of the hindsight bias strengthens the argument for protecting public safety prospectively (through administrative regulation) as opposed to retrospectively (through private tort actions).

The predictions of rational choice theory often lead to the conclusion that, in the absence of externalities and high transaction costs, bargaining will achieve efficiency, and that bureaucratic intervention into private ordering is undesirable.[193] Consequently, behavioral deviations from the predictions of rational choice theory often provide a basis for plausible arguments in favor of government activism. The hindsight bias, however, also carries the seeds of an argument for more restrained government, at least in some circumstances. Just as jurors can be subject to this bias when making negligence determinations (so that they skew their assessment of *ex ante* probabilities), so, too, can administrative decision makers fall prey

191. *See* Landes & Posner, *supra* note 8, at 70; Steven Shavell, *Strict Liability versus Negligence*, 9 J. LEGAL STUD. 1 (1980).

192. For a useful overview of these and related problems, see STEPHEN BREYER, REGULATION AND ITS REFORM (1982), and DANIEL A. FARBER & PHILIP P. FRICKEY, LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION (1991).

193. *See* COOTER & ULEN, *supra* note 8, at 85 ("When transaction costs are zero, an efficient use of resources results from private bargaining, regardless of the legal assignment of . . . rights."); *see generally* Coase, *supra* note 170 (arguing that resources will inevitably move to their highest-valued use when transaction costs are trivial).

to the same bias. Thus, government officials should be cautious when enacting new regulatory regimes after an undesirable incident has occurred.[194]

For example, regulations sufficient to guarantee with near certainty that there will never be an airline fatality are almost certainly too costly to be efficient. The strengthening of air safety regulations following a fatal disaster is justified if the circumstances surrounding the accident provided new information to the agency that caused it to readjust its cost-benefit analysis about a particular regulation. But new regulations would not be justified if the statistical possibility of such a crash was recognized *ex ante* and accepted as justified under a cost-benefit analysis. In other words, agencies need to be careful that the hindsight bias does not cause them to conflate the occurrence of an unfortunate event with the determination that previous cost-benefit analyses were flawed.

4. Anchoring and Adjustment

Research on the phenomenon of anchoring and adjustment demonstrates that probabilistic assessments are often flawed because actors fail to adjust sufficiently their assessments from preexisting cognitive anchors.[195] In one demonstration of this phenomenon, experimenters asked one group of professional accountants whether they believed management fraud occurred in more than ten companies out of each thousand audited by major accounting firms and asked another group of accountants whether they believed fraud occurred in more than two hundred of every thousand such companies.[196] When then asked to estimate the actual number of instances of fraud per thousand companies, the accountants who were exposed to the anchor of two hundred provided, on average, a significantly higher response than the accountants who were exposed to the anchor of ten.[197] There was no logical reason for subjects to believe that the reference number used in the first question was related to the correct answer to the second question. Nonetheless, the subjects apparently failed to adjust sufficiently their estimate of the number of cases of fraud from the number to which they were originally exposed.[198]

194. This, of course, assumes that regulators' sole concern is to balance the costs of prevention against the costs of accidents. It is an interesting question whether regulators' cost-benefit analysis should "count" the utility that citizens might derive from knowing that their government has taken decisive (if perhaps wrongheaded) action after a tragic incident.

195. *See* Amos Tversky & Daniel Kahneman, *Rational Choice and the Framing of Decisions*, 59 J. BUS. S251, S251-54 (1986).

196. *See* Edward J. Joyce & Gary C. Biddle, *Anchoring and Adjustment in Probabilistic Inference in Auditing*, 19 J. ACCT. RES. 120, 122-23 (1981).

197. *See id.* at 125. Subjects given the higher anchor estimated, on average, that fraud occurred in more than 43 companies per 1000, while subjects given the lower anchor estimated, on average, that the number was just over 16. *Id.*

198. For other examples, see PLOUS, *supra* note 34, at 149-51.

In two articles, Korobkin and Guthrie demonstrated experimentally how the anchoring and adjustment bias can affect the settlement of litigation.[199] Two groups of subjects were asked to play the role of the plaintiff in a litigation scenario and to choose between (a) accepting a "final" settlement offer made by the defendant and (b) opting for a trial, with a chance to recover more money but a risk of recovering nothing.[200] One group was told that the defendant had made a relatively low "initial" settlement offer and then raised it substantially to reach the final offer. The other group was informed that the defendant had made a relatively high initial offer and raised it only slightly to reach the same final offer.[201] The actual benefit of settlement and the risk-adjusted expected benefit of trial were identical for subjects in both groups. Subjects in the former group, however, were significantly more likely to accept the final settlement offer, suggesting that their expectations concerning the value of the case had been anchored at a lower level than the expectations of subjects in the latter group.[202]

While this finding does not obviously suggest specific legal policies, it does suggest an interesting and counterintuitive implication for individual attorneys, mediators, judges, and others who are interested in promoting dispute resolution. Contrary to rational choice theory, which would suggest that bargaining characterized by extreme initial offers followed by time-consuming positional bargaining is inefficient because of its high transaction costs and potential for delay,[203] evidence of anchoring effects in bargaining suggests that incurring such costs might actually be an efficient way to resolve disputes because these costly activities increase the chances of out-of-court settlements.

Although the behavioral science literature on anchoring and adjustment emphasizes the way in which numbers can anchor the probability prediction of actors, it is not difficult to see how verbal cues could have similar effects in ways that are relevant to the law. Tort law, for example, permits manufacturers of potentially hazardous products to avoid liability

199. See Russell Korobkin & Chris Guthrie, *Opening Offers and Out of Court Settlement: A Little Moderation Might Not Go a Long Way*, 10 OHIO ST. J. DISP. RES. 1 (1994) [hereinafter Korobkin & Guthrie, *Opening Offers*]; Russell Korobkin & Chris Guthrie, *Psychological Barriers to Litigation Settlement: An Experimental Approach*, 93 MICH. L. REV. 107, 139-42 (1994) [hereinafter Korobkin & Guthrie, *Psychological Barriers*].

200. Korobkin & Guthrie, *Psychological Barriers*, *supra* note 199, at 140.

201. *See id.* at 141.

202. *See* Korobkin & Guthrie, *Opening Offers*, *supra* note 199, at 19.

203. *Cf.* Robert H. Gertner & Geoffrey P. Miller, *Settlement Escrows*, 24 J. LEGAL STUD. 87, 87 (1995) (proposing "settlement escrows" to reduce delays in litigation bargaining); Geoffrey P. Miller, *The Legal-Economic Analysis of Comparative Civil Procedure*, 45 AM. J. COMP. L. 905, 915-16 (1997) (proposing a technique that would avoid the problem of settlements being delayed or never reached because one or both parties refuse to make legitimate settlement offers for fear of appearing weak).

by providing a suitable hazard warning to purchasers of the product.[204] Such a rule appears socially efficient, given the predictions of rational choice theory: informed consumers can balance the risks of using a product against its benefits and decide whether using or not using the product will maximize their utility.[205]

But the efficiency of such a rule is called into question if product manufacturers market their products in such a way as to anchor consumers' perceptions of the safety of the product before providing suitable warnings. Consider, for example, an advertisement for a sport utility vehicle that depicts a driver operating the vehicle at high speeds on irregular terrain. Anchoring and adjustment theory leads to the hypothesis that such marketing ploys might anchor consumer perceptions that it is safe to operate the vehicle in such a manner, making it difficult for the same consumers to adjust sufficiently their safety estimates when they purchase the vehicle and read the manufacturer's detailed warnings that it can be dangerous to operate the vehicle at high speeds under such conditions.[206] If this is true, even a well-designed warning may not lead to optimally efficient consumer choices. One possible legal remedy would be for tort law to deny or reduce liability protection for manufacturers of dangerous products who provide adequate hazard warnings if they advertise their products in ways that are inconsistent with those warnings.

III
THE IMPORTANCE OF CONTEXT

As a thought experiment, consider the two versions of the following well-known hypothetical, originally devised by Tversky & Kahneman:

> (1) You are on your way to see a play for which you do not have a ticket. Tickets cost $10. You realize that you have lost a $10 bill from your wallet. Will you still purchase a ticket for the play?
> (2) You are on the way to see a play for which you have purchased a ticket for $10. You realize you have lost the ticket. Will you purchase another ticket for $10?[207]

Expected utility theory predicts that actors will answer both questions identically.[208] In both cases the actor must compare the benefit of attending

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204. *See, e.g.*, Moss v. Parks Corp., 985 F.2d 736 (4th Cir. 1993) (affirming grant of summary judgment in favor of mineral spirits manufacturer whose product warning label complied with federal labeling requirements).

205. *See generally* W. Kip Viscusi, *Individual Rationality, Hazard Warnings, and the Foundations of Tort Law*, 48 RUTGERS L. REV. 625, 629 (1996) (exploring the cognitive limitations that individuals have in incorporating warnings and suggesting how regulatory policy and tort law ought to take account of those limitations).

206. We thank Retha Stotts for this insight into the possible interaction of advertising and product warnings.

207. Amos Tversky & Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, 211 SCIENCE 453 (1981).

the play with its marginal cost of $10. In both cases, the actor finds he is $10 poorer than he previously believed. This might affect his cost-benefit analysis, but the manner in which the sum was lost should not lead to a different analysis of situation (1) than of situation (2). The empirical results are contrary to this prediction. While nearly all experimental subjects asked the first question answer affirmatively, a majority of those asked the second question answer negatively.[209]

This experiment is often used to illustrate the point that individuals do not consider all money fungible and, instead, establish different "mental accounts" for different classes of goods and services. Having already spent $10 on a theater ticket, subjects exposed to the second hypothetical might find their "theater account" empty, whereas subjects exposed to situation (1) do not have the same problem.[210] We use this experiment to illustrate a far broader point that forms the basis for this Part of the Article: despite rational choice theory's implicit prediction to the contrary, context matters in decision making.

Rational choice theory assumes that when confronted with two options—$10 or a theater ticket, for example—the actor will have a single, inherent value for each option that he can utilize as the basis of a utility-maximizing cost-benefit calculation. In reality, a large number of external circumstances can affect the utility that he will receive from each option, not simply whether he had already purchased (and lost) a theater ticket. Does he normally attend the theater on Saturday night? Will his peers attend the theater? Is the only other option he has considered staying home, or has he also considered attending a concert for which tickets cost $40? Will the play take place tonight, or next month? Answers to all of these questions, it turns out, are likely to affect the actor's decision in systematic ways.

These contextual effects are all inconsistent with the expected utility version of rational choice theory because they violate the invariance principle, which posits that the manner in which a choice is presented should not affect the selection an actor makes so long as the variation in presentation does not affect the outcomes of the choices.[211] Put another way, the preferences of any given actor for A or B shonld be invariant to the means an investigator uses to elicit the subject's preferences.

In this Part, we review some of the evidence of the effects of context, in various guises, on decision making, and describe some of the potential implications of the evidence for legal policy analysis. First, however, a

208. *See, e.g.*, Jolls, *supra* note 148, at 1669 (noting that "standard economic theory predicts no difference between these two situations").

209. *See* Tversky & Kahneman, *supra* note 207, at 457.

210. *See, e.g.*, Jolls, *supra* note 148, at 1669-70.

211. *See supra* Part I.A.2.

brief comment is in order on the similarities and differences between deviations from the predictions of rational choice theory discussed in this Part and those discussed in the previous Part. When policymakers wish to use law as a means of achieving a pre-established goal, understanding the importance of context to decision makers, like understanding boundedly rational decision making, can enable policymakers to establish a closer fit between the means and ends than rational choice theory would permit. But when policymakers wish to use law as a means of promoting efficiency, the policy implications that flow from the importance of context are more complicated than those that flow from bounded rationality. The consequence of bounded rationality is that individuals make particular decisions in ways that are not utility maximizing for them (even though the time and effort saved by using heuristics might enable them to maximize their global utility). To the extent that the law can be used as a tool to help actors make decisions that better maximize their utility in those particular circumstances, law can improve efficiency. In contrast, if an actor selects "choice A" because the choices are presented in a particular context, but he would have otherwise selected "choice B," it is often difficult to determine whether the law will enhance efficiency by reinforcing "choice A," encouraging "choice B" in spite of the context, or changing the context so that the actor will select "choice B." This difficulty will arise throughout this Part, and we suggest some possible solutions in various circumstances where appropriate.

A. Reference Points and the Framing Effect

In 1979, Kahneman and Tversky proposed a descriptive theory of decision making that they called "prospect theory."[212] The theory was meant to serve as a more realistic alternative to expected utility theory in that it accommodated some empirical findings about decision making under uncertainty that did not fit into expected utility theory.[213] One fundamental insight of prospect theory, known as the "framing" effect, is that actors' choices under conditions of uncertainty depend not only on the absolute expected values of the competing options but also on the direction in which those options deviate from a baseline, or reference point.[214] When decision options are perceived as "gains" relative to the reference point, individuals are risk averse; that is, they prefer more certain options to gambles with the same expected value. But when decision options are perceived as "losses" relative to the reference point, the same individuals will be risk-seeking;

212. Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263 (1979).

213. *See id.* at 267.

214. *See* Daniel Kahneman, *Reference Points, Anchors, Norms, and Mixed Feelings*, 51 ORG. BEHAV. & HUM. DECISION PROCESSES 296 (1992); Kahneman & Tverksy, *supra* note 212.

that is, they will prefer a gamble to the certain option when both have the same expected value.[215] For example, when experimental subjects were asked to choose between a certain payment of $240 and a 25% chance to receive $1,000, 84% preferred the certain payment (although this option has a slightly lower expected value than the gamble—$240 versus $250).[216] But when asked to choose between a certain loss of $750 and a 75% chance of losing $1000, 87% preferred the gamble (although the two choices have the same expected value).[217]

Considerable additional research indicates that frames—that is, whether options are perceived as gains or losses—are fluid and easily manipulable, at least in some situations. Consider the following experiment: when subjects were told to imagine that they had been given $1,000 and asked to choose between a certain gain of an additional $500 and a 50% chance of gaining an additional $1,000, 84% preferred the certain payment, thereby exhibiting risk aversion. But when subjects were told to imagine that they had been given $2,000 and then asked to choose between a certain loss of $500 and a 50% chance of losing $1,000, 70% preferred the risky alternative, thereby exhibiting risk preference. Notice that both groups of subjects were asked, in effect, whether they would prefer a certain $1,500 or a 50% chance of $2,000 coupled with a 50% chance of $1,000. Merely by dividing the presentation of the choice into two parts, the experimenters were able to alter the reference point that many subjects used to evaluate the decision, and this, in turn, affected the subjects' revealed preferences.[218]

How frames can affect decision making in the context of litigation has been explored in three sets of experiments, including one by Korobkin and Guthrie.[219] In those experiments, subjects playing the role of plaintiffs in a litigation matter were asked to choose between a certain settlement offer of $21,000 and a trial that could potentially yield $28,000 but had a risk-adjusted expected value of $19,000. Predictably, and in accordance with the predictions of rational choice theory, subjects chose the safe choice with the higher expected value when both the settlement and the most desirable trial verdict would leave them better off than they were prior to the accident that gave rise to the litigation—that is, when the losses suffered in the accident were less than $21,000.[220] But subjects facing the same choice

215. *See* Kahneman, *supra* note 214, at 298.

216. *See* Tversky & Kahneman, *supra* note 195, at 255.

217. *See id.*

218. Note that these robust experimental results imply violation of the invariance principle, one of the background conditions for the operation of expected utility theory. *See supra* Part I.A.2.

219. *See* Korobkin & Guthrie, *Psychological Barriers*, *supra* note 199; *see also* Linda Babcock et al., *Forming Beliefs about Adjudicated Outcomes: Perceptions of Risk and Reservation Values*, 15 INT'L REV. L. & ECON. 289 (1995); Jeffrey J. Rachlinski, *Gains, Losses, and the Psychology of Litigation*, 70 S. CAL. L. REV. 113 (1996).

220. *See* Korobkin & Guthrie, *Psychological Barriers*, *supra* note 199, at 130-33.

between the certain settlement offer of $21,000 and the risky trial prospect were significantly more likely to opt for trial if accepting the settlement would have left them worse off than they were prior to the accident—that is, when the losses suffered in the accident exceeded $21,000.[221] Although both groups of subjects faced the same choice, in absolute terms, subjects in the first group could only perceive their choice as one between "gains," while subjects in the second group could have perceived their choice as one between "losses" if they viewed it from a "pre-accident" rather than a "post-accident" reference point.[222] Consistent with the predictions of prospect theory, subjects who could plausibly view the decision to settle or go to trial as a choice between "losses" were more likely to exhibit risk-seeking behavior.

If litigants often perceive the choice between settlement and trial to be a choice between losses, the framing effect, like the self-serving bias, can provide a plausible explanation for why lawsuits sometimes fail to settle out of court despite the enormous costs of litigating to a final adjudication. Indeed, Jeffrey Rachlinski has argued that plaintiffs are likely to perceive litigation options as "gains," since they stand to receive money, whereas defendants are likely to perceive their options as "losses," since they generally stand to pay money.[223] As a result, plaintiffs may be more willing to settle than previously thought, and defendants more willing to litigate. If this is correct, then the legal system may wish to focus its efforts on encouraging defendants (rather than plaintiffs) to settle. Moreover, if legal policymakers believe it is appropriate for the legal system to encourage low-cost dispute resolution, evidence of the framing effect provides support for semicoercive dispute resolution measures, such as mandatory pretrial mediation, arbitration, or court-supervised settlement conferences, or even more coercive measures, such as requirements that plaintiffs who fail to recover at trial an amount greater than the defendant's most generous settlement offer be held liable for the defendant's trial costs.[224]

As a more general matter, evidence of the framing effect suggests two possible types of strategies for legal policymakers who wish to encourage a certain behavior. First, to the extent that frames can be manipulated (in that options can be presented as gains or losses), the government can attempt to present actors with information framed in a way to encourage the desired

221. *See id.*

222. *See* Russell Korobkin & Chris Guthrie, *Psychology, Economics, and Settlement: A New Look at the Role of the Lawyer*, 76 TEX. L. REV. 77, 99 (1997).

223. Rachlinski, *supra* note 219, at 128 (presenting experimental evidence that subjects playing the role of plaintiff were more likely to favor settlement relative to a trial with a given expected value than subjects playing the role of defendant).

224. *See, e.g.*, IND. CODE ANN. § 34-50-1-6 (West 1998) (awarding attorney's fees if the plaintiff refuses a settlement offer and the final judgment is less favorable to the plaintiff than the settlement); OKLA. STAT. ANN. tit. 36, § 3629 (West 1998) (awarding costs and attorney fees in insurance matters to the insured if the judgment exceeds the highest settlement offer and to the insurer otherwise).

behavior. If risk-averse behavior is desirable, information should be framed in a way to encourage actors to see their options as choices among gains; if risky behavior is desirable, information should be framed in a way to encourage actors to see their options as choices among losses.

Second, to the extent that frames are difficult to manipulate and this difficulty may lead to undesirable behavior, government should consider removing choices from the realm of individual decision making. As an example, assume that the government decides that, for the purpose of automobile safety, it is desirable to increase the use of seatbelts. People who are accustomed to not wearing a seatbelt, however, are likely to view the decision of whether or not to do so as a choice between losses. Wearing a seatbelt will likely be perceived as causing a small but certain loss of freedom and comfort. Not wearing a seatbelt, in contrast, can be seen as subjecting the actor to a small possibility of a very large loss (in the form of increased injuries if an accident occurs), coupled with a large possibility of no loss at all (if there is no accident). Of course, people who view the inconvenience of wearing a seatbelt as minor and the risks of possible injury as catastrophic will choose the safe option of buckling up, even when the problem is viewed as a choice between a certain loss and a probabilistic loss. But viewing the problem as one of competing losses can cause actors on the margin to engage in risk-seeking behavior; in this case, to choose not to wear the seatbelt. The government might respond by removing the safety decision from individual actors. For example, mandatory seatbelt laws can be imposed,[225] or automobile manufacturers can be required to install air bags in their cars,[226] thus providing some of the desired increase in safety without relying on the choices of drivers.

B. The Endowment Effect and the Status Quo Bias

Under any of the usual conceptions of rational choice theory, an actor faced with a choice between two items—say, for example, between a loaf of bread and a glass of wine—should compare the inherent value to him of each and select the item with the higher value.[227] Whether he owns the loaf of bread, the glass of wine, or neither, should make no difference as to which item he would prefer. An unusually rich body of behavioral science

225. *See, e.g.*, ARK. CODE ANN. § 27-37-702(a) (LEXIS 1999); D.C. CODE ANN. § 40-1602(a) (Michie 1998); HAW. REV. STAT. ANN. § 291-11.6(a)(1) (LEXIS 1998); N.C. GEN. STAT. § 20-135.2A(a) (LEXIS 1999); OKLA. STAT. ANN. tit. 47, § 12-417A (1998); S.C. CODE ANN. § 56-5-6520 (Law Co-op. 1998).

226. *See* 49 U.S.C.A. § 30127(b)(C) (1998) (mandating air bags in every new car beginning in 1997).

227. *See, e.g.*, Samuel Issacharoff, *Can There Be a Behavioral Law and Economics?*, 51 VAND. L. REV. 1729, 1735 (1998) (explaining that law and economics presumes that value is "source independent"); Murray B. Rutherford et al., *Assessing Environmental Losses: Judgments of Importance and Damage Schedules*, 22 HARV. ENVTL. L. REV. 51, 61 (1998) (noting that "traditional economic theory" asserts that valuations of gains and losses are the same).

literature demonstrates, however, that individuals often place a higher monetary value on items they own than on those that they do not own. Because the consequence of this effect is that people place a higher value on their endowments than on other items, this phenomenon is often referred to as the "endowment effect."[228] Because the effect also results in actors' placing a higher dollar value on goods they are selling than on goods they are buying, it is also referred to as the "offer/asking gap"[229] or the "Willingness to Accept (WTA)/ Willingness to Pay (WTP) gap."[230] However labeled, the effect is a consequence of the fact that individuals tend to value losses more highly than equivalent gains (and thus wish to avoid "losing" things more than they desire "gaining" things of an equivalent value). This phenomenon, known descriptively as "loss aversion," is a close relative of the framing effect,[231] discussed above.

The most famous examples of the endowment effect come from a series of experiments concerning mugs and lottery tickets. In one experiment, Kahneman and his colleagues provided each member of one group of subjects with a coffee mug and each member of another group with $6.[232] They elicited from the first group ("sellers") the minimum price that the subjects would demand to give up the mug. From the second group ("buyers"), they elicited the maximum amount of money that the subjects would pay to acquire one of the mugs.[233] Both groups were told that the experimenters would take this information, calculate the market-clearing price for the mugs, and reallocate and execute trades between the mug holders who would prefer cash to their mug at the market price and the cash holders who would prefer a mug to cash at that price.[234] Surprisingly, from the perspective of rational choice theory,[235] sellers valued the mug at roughly twice the price of buyers, and very few trades took place, even when

228. *See, e.g.*, Richard Thaler, *Toward a Positive Theory of Consumer Choice*, 1 J. ECON. BEHAV. & ORG. 39, 44 (1980).

229. *See, e.g.*, Duncan Kennedy, *Cost-Benefit Analysis of Entitlement Problems: A Critique*, 33 STAN. L. REV. 387, 401 (1981) (referring to the "offer/asking" problem); Russell Korobkin, *Policymaking and the Offer/Asking Price Gap: Toward a Theory of Efficient Entitlement Allocation*, 46 STAN. L. REV. 663, 664-65 (1994).

230. *See, e.g.*, Elizabeth Hoffman & Matthew L. Spitzer, *Willingness to Pay vs. Willingness to Accept: Legal and Economic Implications*, 71 WASH. U. L. Q. 59 (1993).

231. *See, e.g.*, Kahneman & Tversky, *supra* note 212, at 279 (discussing loss aversion as an element of prospect theory).

232. *See* Daniel Kahneman et al., *Experimental Tests of the Endowment Effect and the Coase Theorem*, 98 J. POL. ECON. 1325 (1990); *see also* Jolls et al., *supra* note 13, at 1483-84 (discussing Kahneman's experiment).

233. *See* Daniel Kahneman et al., *supra* note 232, at 1330-31. Note that the experimenters gave the "buyers" cash to avoid the problem of "sellers " being wealthier than buyers, on account of owning the mug.

234. *See id.* at 1331.

235. The reason the result is surprising to rational choice theorists is that there is no particular reason not to imagine that tastes for mugs *versus* cash are symmetrically distributed among any random group of subjects so that about half of mugs and cash should change hands.

multiple iterations of the experiment were conducted to allow participants to learn from experience.[236]

In another experiment, Knetsch and Sinden gave some experimental subjects lottery tickets, which entitled the holder to the chance to win a sum of money, and gave others $3, then offered to buy the tickets from ticket holders for $3 and offered to sell tickets to cash holders for $3.[237] The majority of ticket holders elected to keep their tickets, while the majority of cash holders elected to keep their cash,[238] again suggesting that ownership affected the value that subjects placed on the items.

The most obvious policy implications of the endowment effect come in the area of property law. Much of the law-and-economics approach to property law is based on the insight of the Coase Theorem that the assignment of property rights has no efficiency impact if transaction costs are low.[239] In such circumstances, any individual who has a higher value for a given entitlement than the original owner will purchase it from the owner. From this follows the general principle that property law should seek to minimize transaction costs, as well as other, more specific corollaries, including the following: (1) property rights should be clearly delineated, because cloudy title increases transaction costs;[240] (2) injunctions are the preferred remedies to damages unless transaction costs are very high, because injunctions clarify property rights (again, facilitating bargaining) and court-determined damages can be unpredictable;[241] and (3) property rights should often be assigned to the claimant who can transfer the right most cheaply.[242]

Evidence of the endowment effect calls into question the efficiency of each of these law-and-economics prescriptions. The endowment effect acts similarly to transaction costs: it presents a barrier to the reallocation of property rights from an owner to another party who can put those rights to

236. *See* Kahneman, *supra* note 232, at 1332.

237. *See* Jack L. Knetsch & J.A. Sinden, *Willingness to Pay and Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measures of Value*, 99 Q. J. ECON. 507, 512 (1984).

238. *See id.* at 513.

239. *See* Coase, *supra* note 170, at 6; *see also* COOTER & ULEN, *supra* note 8, at 85 (summarizing the Coase theorem).

240. *See, e.g.*, COOTER & ULEN, *supra* note 8, at 93 ("Lowering transaction costs 'lubricates' bargaining. One important way for the law to do this is by defining simple and clear property rights.") and 107 ("[T]he law can achieve the efficient allocation of private goods by, for example, lowering bargaining costs by assigning clear and simple ownership rights.").

241. The original insight comes from Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1116-17 (1972). *See also* COOTER & ULEN, *supra* note 8, at 102-03; James E. Krier & Stewart J. Schwab, *Property Rules and Liability Rules: The Cathedral in Another Light*, 70 N.Y.U. L. REV. 440, 445 (1995).

242. *See, e.g.*, MARK KELMAN, A GUIDE TO CRITICAL LEGAL STUDIES 123-24 (1987) (describing the "market facilitating" approach to entitlement allocation); Korobkin & Ulen, *supra* note 7, at 336-38; *see also* Coase, *supra* note 170, at 17-18.

a more valuable use. Consequently, in some situations it might be efficiency enhancing to leave property rights somewhat unclear, in an effort to prevent an endowment effect from taking hold.[243] If the endowment effect causes lower-valuing owners to refuse to sell entitlements to higher-valuing purchasers, damage remedies may be more efficient than injunctive relief because the former permits the higher-valuing purchaser to take the entitlement by paying the market price for it.[244] Finally, the endowment effect suggests that, even when transaction costs are low, policymakers concerned with efficiency should attempt to allocate property rights to their most efficient user due to the reduced likelihood of efficient reallocations.

This last point provides an opportunity to highlight an important complication that the endowment effect raises for policymakers interested in allocating property rights efficiently—that is, to their highest-valuing user. Determining which claimant places the highest value on the resources in question can be much more complex than the assumptions of rational choice theory would suggest. Consider the following two hypothetical situations, described in ascending order of difficulty:

> (1) Cain would be willing to pay (WTP) $5,000 for a piece of property if he did not own it, but would accept (WTA) no less than $7,000 to sell it if he did own it. Abel has a WTP of $4,000 for the same piece of property and a WTA of $6,000.
> (2) Cain has a WTP of $3,000 for a piece of property and a WTA of $7,000. Abel has a WTP of $4,000 for the same piece of property and a WTA of $6,000.

We summarize these cases in the following figure:

	Situation (1)			Situation (2)	
	Cain	Abel		Cain	Abel
WTP	$5,000	$4,000	WTP	$3,000	$4,000
WTA	$7,000	$6,000	WTA	$7,000	$6,000

FIGURE 2

243. Ian Ayres and Eric Talley have argued for cloudy or divided property rights from within the rational choice paradigm, claiming that uncertainty reduces rational strategic behavior that can block efficient entitlement transactions. *See* Ian Ayres & Eric Talley, *Solomonic Bargaining: Dividing a Legal Entitlement to Facilitate Coasean Trade*, 104 YALE L.J. 1027, 1029-30 (1995) ("[W]hen two parties have private information about how much they value an entitlement, endowing each party with a partial claim to the entitlement can reduce the incentive to behave strategically during bargaining, thereby enhancing economic efficiency."). *But see* Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713, 779-88, 790 nn.69 & 71 (1996) (criticiziug the Ayres & Talley article and arguing generally for liability rules to deter externalities and for property rules to protect holdings in things).

244. Jolls, Sunstein, and Thaler have hypothesized that parties who litigate contested entitlements and are actually awarded injunctive relief by a court are particularly unlikely to bargain away their endowment, even when the opposing party places a higher value on it, because they are likely to believe they have earned and/or are particularly entitled to the endowment. *See* Jolls et al., *supra* note 13, at 1497-1501.

In both situations, the initial allocation decision is of critical importance because the property will not be exchanged: if Cain originally owns the property, then he would demand more for the property than Abel would be willing to pay for it, and if Abel originally owned the property, then he would demand more than Cain would be willing to pay.

Although either initial allocation would be Pareto optimal,[245] most observers would probably agree that in situation (1), Cain is the more efficient user of the property, since both his WTP and WTA values exceed Abel's equivalent values. In situation (2), the identity of the efficient owner is far less clear, because Cain has a higher WTA than Abel but Abel has a higher WTP than does Cain.[246] Determining how to allocate the property most efficiently in this set of circumstances requires a more nuanced understanding of the reasons that Cain and Abel might have asymmetrical differences between their WTA and WTP values, a complicated question that is far beyond the scope of this Article.[247] But the example aptly illustrates that evidence of the endowment effect calls for a more sophisticated analysis of how to assure the efficient distribution of property rights than rational choice theory requires.

Discussions of the endowment effect usually assume that the disparity often observed between an actor's WTP and WTA values is a function of ownership. But related experimental evidence shows that the endowment effect is better understood as a specific application of a more general phenomenon, often known as the "status quo bias."[248] Although there might be some unique attributes of ownership that make actors especially reluctant to part with items in which they enjoy property rights, the behavioral science literature indicates that actors tend to place a higher value on any state of affairs that they consider to be the status quo than they would place on that same state of affairs if it were not the status quo, regardless of whether property ownership is implicated.[249]

This broader status quo bias has implications for legal policy far beyond the confines of property law. Consider some implications for the promulgation of contract law rules. Traditional law-and-economics analysis of contract "default" rules—that is, rules that govern the relationship between contracting parties only if the parties do not explicitly agree to different terms—posits that (1) unless transaction costs are unusually

245. An allocation is Pareto optimal if it is impossible to reallocate goods and services so as to make one party better off without making another party (in this case, the other party) worse off. *See* COOTER & ULEN, *supra* note 8, at 12.

246. Indeed, one of the problems that this analysis highlights is the ambiguity in the concept of "highest-valuing user."

247. For a theoretical analysis of how policymakers concerned with efficient property allocations might solve this problem, see Korobkin, *supra* note 229.

248. *See* William Samuelson & Richard Zeckhauser, *Status Quo Bias in Decision Making*, 1 J. RISK & UNCERTAINTY 7 (1988).

249. For a series of examples, *see id.*

high, the choice of default rules will have little effect on contract terms because wealth-maximizing parties will contract around inefficient default terms,[250] and (2) default terms should mirror the terms that the majority of contracting parties would choose ("majoritarian" defaults) to minimize the transaction costs when contracting around inefficient defaults.[251]

Evidence of the status quo bias suggests that revisions to both elements of the conventional wisdom are appropriate. In a recent article, Korobkin has shown experimentally that default rules are more difficult to contract around than rational choice theory explanations suggest. This is because contracting parties are likely to see default terms as part of the status quo and, consequently, prefer them to alternative terms, all other things equal.[252] If this is correct, default terms will be "sticky," and the choice of defaults may determine the terms that the parties adopt in many cases. Even if majoritarian terms are selected as defaults, this stickiness will cause some of the parties in the "minority" to adopt inefficient contract terms. To avoid this inefficiency, default terms tailored to specific parties and determined by courts at the time disputes arise might be preferable to well-specified majoritarian defaults. The former, by leaving the content of default rules at the time of contracting unresolved, should reduce the opportunities for parties to become biased in favor of the status quo terms.[253]

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250. *See, e.g.*, ROBERT A. HILLMAN, THE RICHNESS OF CONTRACT LAW: AN ANALYSIS AND CRITIQUE OF CONTEMPORARY THEORIES OF CONTRACT LAW 225 (1997); *see also* Bernard S. Black, *Is Corporate Law Trivial?: A Political and Economic Analysis*, 84 NW. U. L. REV. 542, 557 (1990) (claiming that default rules in corporate law "aren't very important" because parties can contract out of them at low cost).

251. *See, e.g.*, HILLMAN, *supra* note 250, at 225 ("the efficient . . . default rule is what most parties would want"); POSNER, *supra* note 26, at 105 (explaining that in interpreting contracts, courts establish default rules that "imagine how the parties would have provided for the contingency if they had decided to do so"); Charles J. Goetz & Robert E. Scott, *The Mitigation Principle: Toward a General Theory of Contractual Obligation*, 69 VA. L. REV. 967, 971 (1983) (default rules should be created by asking "what arrangements would *most* bargainers prefer?"). Against the majoritarian interpretation, Ayres and Gertner have argued in favor of what they call "penalty" default rules, which would not reproduce what most parties desire but would be structured in favor of the least-advantaged party so as to create an incentive for the more-advantaged party to divulge information. *See* Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L.J. 87 (1989) (giving as an example of a penalty default the Uniform Commercial Code's rule voiding a contract for failing to specify a quantity term). *But see* Jason Scott Johnston, *Strategic Bargaining and the Economic Theory of Contract Default Rules*, 100 YALE L.J. 615 (1990) (arguing that a penalty default may not induce parties with superior information to divulge that information if doing so leaves them open to exploitation by the other party).

252. *See* Russell Korobkin, *The Status Quo Bias and Contract Default Rules*, 83 CORNELL L. REV. 608, 637-47 (1998) [hereinafter Korobkin, *Status Quo Bias*]. For additional evidence of the effect of the status quo bias on the negotiation of contract terms, see Russell Korobkin, *Inertia and Preference in Contract Negotiation: The Psychological Power of Default Rules and Form Terms*, 51 VAND. L. REV. 1583 (1998) [hereinafter Korobkin, *Inertia*].

253. *See* Korobkin, *Status Quo Bias*, *supra* note 252, at 670-73.

Even if policymakers determine that majoritarian defaults are appropriate despite the presence of the status quo bias, the bias highlights the difficulty that policymakers face in attempting to determine which terms the majority of contracting parties would favor. For instance, the employment law academy has long debated whether the proper default rule for employment contracts should be that employers may dismiss employees "at will" or only for "just cause." In the United States, the "at will" rule has long been the dominant default.[254] Law-and-economics scholars operating within the rational choice paradigm have often cited as evidence for the efficiency of this rule the empirical fact that relatively few parties apparently contract around this default.[255] The status quo bias reveals that this logic is fallacious. The fact that parties rarely contract around the "at will" rule might mean that "at will" employment is efficient for most parties, but it also might mean that the status quo bias swamps a preference many parties would otherwise have for a "just cause" term.[256] At a minimum, the status quo bias demands that lawmakers seeking to promulgate majoritarian default terms look for evidence other than what terms are adopted in a market with an existent default for indications as to what terms the majority wonld prefer.

C. *Habits, Traditions, Addictions, and Cravings*

Judgment and behavior are affected not only by the relationship of decision options to baseline reference points but also by their relationship to temporally separated behaviors. This Section examines the implications of the effect that past behaviors, and the related phenomenon of visceral drives, can have on current choices. The following Section examines the effect that the temporal distance between the effects of different options—specifically, the distance between the present decision and future consequences—can have on choices.

Because economists employing rational choice theory generally assume preferences are determined independent of behaviors, a common

254. *See* J. Hoult Verkerke, *Employment Contract Law*, *in* THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW 47 (Peter Newman ed., 1998).

255. *See* Richard A. Epstein, *In Defense of the Contract at Will*, 51 U. CHI. L. REV. 947, 951-52 (1984) (stating that the contract at will requirement is "freely waivable by a joint expression of contrary intention," yet remains (and should remain) the most common employment relationship); Richard A. Epstein, *Standing Firm, on Forbidden Grounds*, 31 SAN DIEGO L. REV. 1 (1994) (continuing to defend the contract-at-will doctrine against a host of critics of his book-length defense, *Forbidden Grounds*); J. Hoult Verkerke, *An Empirical Perspective on Indefinite Term Employment Contracts: Resolving the Just Cause Debate*, 1995 WIS. L. REV. 837, 867-75 (1995).

256. Of course, another possibility is that a "just cause" term would be efficient for many parties but employees do not wish to bargain for it because they fear such a request would be perceived by employers as a sign that they were likely to shirk their responsibilities. *See, e.g.*, Samuel Isaacharoff, *Contracting for Employment: The Limited Return of the Common Law*, 74 TEX. L. REV. 1783, 1794-95 (1996).

assumption is that choices an actor has made in the past will not affect his current preference structure.[257] For example, if Abel had been asked to choose between an apple and an orange yesterday and chose the orange, this would not affect how likely he would be to choose an orange today (although it would certainly support a prediction that he would be likely to choose an orange today). To the extent that rational choice theorists believe that yesterday's choice will affect today's, the correlation is usually presumed to be negative, an application of the concept of declining marginal utility.[258] Even someone who loves oranges will desire his first orange more than his second, and so on. If Abel ate too many oranges yesterday, the utility he would derive from eating yet another orange today might dip below the utility he would derive from his first apple.

The problem for the conventional conceptions of rational choice theory is that the relationship between past and present actions is often positive rather than negative. That is, the fact that an actor acted in a certain way in the past can increase the likelihood that he will act in the same way in the future. This positive effect of past choices on current ones can result from at least three somewhat different phenomena, which we will define as "habits," "traditions," and "addictions."

Actors often repeat behaviors (or repeatedly choose the same good or service) out of "habit," as a way of reducing the costs of decision making. Repetition of behavior is, in this way, used as a heuristic device. We may drive the same way to work today not because we determine when we start the ignition that this is the most efficient (or utility-maximizing) route but because we presume that it is likely to be efficient because we have used it before. This calculation often will be unconscious. Like other heuristics, decision making via habit is often quite rational in a global sense, because it permits us to approximate utility-maximizing behavior at a reasonable cost, as when we develop the habit of always putting on our seatbelt or of looking both ways before stepping into the street. But habitual behavior can have the consequence of causing actors to make suboptimal decisions in particular circumstances.

Whereas behaviors that result from force of habit can be viewed as heuristic based, behaviors that are driven by "tradition" can be seen as closely related to the status quo bias. Consider, for example, a person who gets negative utility from eating fruitcake and would, therefore, normally decline even a free slice, but eats fruitcake with abandon every winter holiday season. Like the status quo bias, the power of tradition results from

257. *See, e.g.*, Gary S. Becker, *Habits, Addictions, and Traditions*, 45 KYKLOS 327, 327 (1992) ("The usual assumption in most discussions of behavior over time is that choices today are not directly dependent on choices in the past.").

258. *See* MICHAEL L. KATZ & HARVEY S. ROSEN, MICROECONOMICS 57 (1991) (increasing the consumption of a good decreases the marginal utility of additional units of the good consumed).

the utility that individuals derive from conforming to a shared family, group, or community practice, rather than from the inherent value of a behavior. Of course, the inherent value of a traditional activity is far from being beside the point. Individuals are unlikely to engage in truly despised behaviors merely because of tradition. For example, a person made ill by fruitcake is unlikely to eat it even at Christmas despite the long-time family tradition to do so. They are, however, more likely to make a given decision or engage in a given behavior if they have a tradition of doing so than if they do not. Unlike the heuristic of habit, "traditions," in our taxonomy, have a conscious effect on individual preferences.[259]

"Addictions," like traditions, result when the fact that an actor has engaged in a behavior in the past makes him more likely to engage in that behavior in the future because the past behavior makes current behavior more pleasant. From one vantage point, an addiction is just a particularly powerful species of tradition.[260] But the physical or chemical compulsion that motivates an "addict," under the common understanding of the term, suggests to us that the effects of addiction are different in kind, not merely in degree, from the effects of tradition and that, therefore, very different policy implications might flow from the two phenomena. A person whose desire to drink, smoke, or gamble, is motivated by the fact that he has engaged in those activities before, we believe, belongs in a different category from that of a person whose desire to eat fruitcake is motivated by the fact that he does so every Christmas without fail.

The positive relationship between past and present behaviors as represented by habits, traditions, and addictions, has two potentially broad implications for legal policy. The first, and relatively uncontroversial, implication is that policymakers attempting to encourage or discourage certain behavior should realize that behaviors motivated by habit, tradition, or addiction, are likely to be much more difficult to manipulate than rational choice theory would predict. When past behavior, rather than merely inherent value, drives the utility that an actor receives from current behavior, laws that try to offset the inherent utility of a behavior with corresponding costs will not create a sufficient deterrence. To use a stark example, this is probably why draconian federal criminal penalties for possession of even a relatively small quantity of crack cocaine have failed to

259. Traditions, when shared, may be a means of solidifying community bonds through rituals. To the extent that traditions serve this purpose, they resemble social norms, which we examine in Part IV.A below.

260. *Cf.* Alan Schwartz, *Views of Addiction and the Duty to Warn*, 75 VA. L. REV. 509 (1989) (arguing that addicts continue to engage in addictive behavior only when the benefits of doing so exceed the costs to them).

put an end to drug use.[261] Even if the risk-adjusted expected cost of using an illegal substance exceeds the inherent benefit to an individual of doing so, the addict is unlikely to go straight. At least in such extreme situations, policymakers are likely to have to find measures other than merely increasing the price of the undesirable behavior if they hope to eliminate it.

The more controversial policy question is to what extent the law should paternalistically attempt to protect individuals from "harmful" habits, traditions, and addictions (those that reduce an actor's total utility over time), or to encourage "beneficial" habits, traditions, and addictions (those that increase future utility).[262] High "sin" taxes on addictive substances can be seen as an example of the former approach. The cost-benefit tradeoff involved in smoking, for example, might appear more favorable initially than it will over the long run as the health risks increase and the ease of quitting decreases. The government might tax such behavior to the point that only individuals who would actually maximize their utility over the long term by smoking will begin the habit.[263] Rational choice theorists would argue that even if actions in time period 1 motivate behavior in time period 2, a rational individual will equate long-term costs with benefits, taking into account the power of a phenomenon such as addiction, and choose to engage only in activities that they expect to be utility enhancing over the long term.[264] But there are many reasons that this prediction too could fail—for example, if actors are overconfident about their ability to avoid the utility-decreasing effects of harmful traditions and addictions. Addictive behaviors seem likelier targets for this type of legal intervention than merely traditional behaviors, as there is a stronger sense with the former that the future behavior lacks an element of free will that is present with the latter. In addition to governmental prodding, private parties may create incentives for individuals to avoid activities with long-term adverse effects. For example, health and life insurers may offer lower premiums to those who refrain from smoking and drinking.

Just as the government might tax behaviors that motivate harmful future behavior, it might actually or constructively subsidize behaviors that motivate future beneficial behavior. For example, fastening a seatbelt when driving might be a behavior that is initially costly, as the driver must remember to fasten the belt and must suffer a loss of comfort. As fastening

261. *See* Timothy Egan, *War on Crack Retreats, Still Taking Prisoners*, N.Y. TIMES, Feb. 28, 1999, at A1, A20 (reporting that studies show drug use has remained constant over the last decade even in the face of increasing criminal sanctions).

262. The distinction is drawn from Becker, *supra* note 257, at 328.

263. We set to one side the difficult task of specifying how this determination might be made.

264. *See generally* Becker, *supra* note 257. Becker notes that because of uncertainty an actor might develop a habit that turns out to have a negative net utility, but his argument is premised on the belief that an actor will accurately perceive the likelihood of various future consequences of current behavior. *See id.*

the seatbelt becomes a habit, however, the costs of doing so decrease greatly, and it is possible that the feeling of inconvenience is replaced by a feeling of comfort and security as the behavior becomes habitual. Consequently, it is possible that, left to their own devices, actors will underutilize seatbelts unless they are somehow prodded to change their habits. Laws can provide such prodding by fining the failure to wear seatbelts or by recognizing a seatbelt defense in negligence cases (under which victims in automobile collisions could recover only the damage that they wonld have suffered had they been wearing a seatbelt). If these efforts prove unavailing, the law can go beyond habit reinforcement by requiring, for example, that all cars come with passive restraint systems, such as airbags.

Behaviors that are motivated by addictions bear a strong resemblance to behaviors that are motivated by visceral cravings, although the two phenomena have different etiologies. Visceral cravings include hunger, thirst, sexual desire, sleep, and pain, to name a few examples.[265] Unlike addictions, such cravings are generally evolved traits rather than desires that stem directly from past individual behaviors.[266] But much like harmful addictions, visceral cravings can overpower actors, causing them to act in ways that fail to maximize utility. Hunger can make the dieter overeat, even though he would rather lose weight than enjoy a fattening meal. Sleepiness can make the truck driver fall asleep at the wheel, even though the costs of doing so clearly outweigh the benefits.

Rational choice theory leads to the prediction that events that create negative net utility will not occur. The utility-maximizing actor can use precommitment strategies to make sure that temptations are out of reach when cravings arise, just as he can avoid indulging in potentially addictive behaviors.[267] The dieter can keep only celery stalks in the refrigerator, for example, and the long-distance trucker can stop for the night at the first sign of sleepiness.[268]

Rational choice can fail as a behavioral prediction in these situations because actors tend systematically to underestimate the power of such visceral cravings before they occur, which hampers rational advanced

265. For a very thoughtful treatment of the behavioral impact of these and other visceral drives, see George Loewenstein, *Out of Control: Visceral Influences on Behavior*, 65 ORG. BEHAV. & HUM. DECISION PROCESSES 272, 272 (1996).

266. This distinction, while suitable for the purposes of this article, is perhaps a bit too simplistic, as the intensity of universal visceral cravings might be affected by individual behaviors.

267. *See* Schelling, *supra* note 77. Contrast the view in the text of the difficulty that actors have with visceral cravings and Schelling's view that individuals are at least rational enough to recognize some of their own limitations and to take actions (such as putting the alarm clock out of easy reach across the room) so as not to be put in a position of being at the mercy of this lack of self-control.

268. Alternatively, a driver might purchase a special device that must be squcezed around the steering wheel. If the driver relaxes pressure on the device, as he might do if falling asleep, the device will emit a loud sound to startle the driver awake. We learned of this device from a talk by Thomas Schelling, "A Critique of Rational Choice Theory," Society for the Advancement of Socio-Economics, Vienna, July 13, 1998.

planning.[269] Consider the following clever demonstration of this by Loewenstein and his colleagues. Experimental subjects were recruited and told they would be compensated if they agreed to complete a quiz that would test their knowledge of history. Some subjects were asked to choose, prior to completing the quiz, whether they would be compensated with a large chocolate bar or a specified cash payment. Other subjects knew what their choice of compensation would be but were not required to make the choice until they had completed the quiz. Subjects in the latter group were significantly more likely to select the chocolate bar than subjects in the first group, demonstrating that people are often not very good at predicting the power of their cravings before a temptation is imminent.

This insight goes a long way toward explaining why government policies that attempt to encourage or coerce behavior that allows individuals to avoid the ill effects of visceral cravings are often less successful than rational choice theory would predict. Faced with evidence that massive public health campaigns to encourage condom use to prevent the spread of AIDS and other sexually transmitted diseases have enjoyed limited success, Richard Posner, writing from the perspective of rational choice theory, concludes that for many people the benefits of engaging in unsafe sexual practices outweigh the costs of doing so.[270] A more plausible explanation of the data, we believe, is that many people who would conclude that condom use is utility maximizing for them fail to predict the power of sexual cravings. Consequently, they are not sufficiently prepared for the magnitude of the cravings when the cravings arise, and they engage in unsafe sex despite their better judgment.[271]

In situations in which visceral cravings, like addictions, are especially likely to cause individuals to act in ways contrary to their more considered, stable judgments as to how to maximize their utility, an argument can be made for more aggressive *ex ante* government regulation. If rational choice theory provided sufficient predictions of behavior, the government would need to do no more to combat the spread of AIDS than to make sure that information concerning the risks of unsafe sex was made available to the general public. But in a world in which visceral cravings can overwhelm considered judgment, it might be more efficacious to require the installation of condom machines in public restrooms or, as San Francisco did in

269. *See* Loewenstein, *supra* note 265, at 281-82.

270. RICHARD A. POSNER, SEX AND REASON 114 (1992) ("'Safe sex' is not a perfect substitute for unsafe sex . . . .").

271. *Cf.* Loewenstein, *supra* note 265, at 279 (predicting that "[i]f food, pain killers, or sex have undesirable consequences [actors] will plan to desist from these behaviors. When these visceral factors arise, however, and increase [their] momentary valuation of these activities, . . . [actors] will deviate from [their] prior plans.").

the early 1980s, to close bathhouses notorious for encouraging the spread of the virus.[272]

D. *Time Inconsistencies and the Multiple-Selves Problem*

Many of life's decisions require individuals to compare short-term versus long-term benefits. For example, we must decide whether to spend money today or invest it so we will have more to spend tomorrow; whether to leave work early to enjoy the afternoon or labor late into the night in hopes of increasing our job security or earning a raise; whether to eat an ice cream cone after dinner for immediate gratification or to make do with carrot sticks in order to be thinner in the future. Because of the time value of money, rational actors will discount future income.[273] That is, in order to give up a dollar today, they will demand something more than a dollar tomorrow. In theory these same calculations should apply to the future enjoyment of goods other than money, so that those future goods should also be discounted to present value for decision-making purposes, although for somewhat different reasons. A day of vacation today should be worth somewhat more than a day tomorrow, for example, since there is a chance that tomorrow may never come. However, because different individuals have different preferences for present over future consumption (referred to as their "rate of time preference"), different individuals might have very different discount rates. If investments earned a risk-free 10% annual return, some individuals would invest a large portion of their salary while others would invest nothing, and members of both groups could be maximizing their utilities in so doing.[274]

Although different discount rates across individuals are consistent with (at least thin conceptions of) rational choice theory,[275] that theory

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272. *See* RANDY SHILTS, AND THE BAND PLAYED ON (1988) (discussing the controversy surrounding the decision of the San Francisco Public Health Director to close public bath houses in 1980 to help prevent the spread of AIDS and other STDs).

273. *See* KATZ & ROSEN, *supra* note 258, at 164 (stating that the present value of an amount of money, M, to be received t time periods in the future is equal to the dollar amount of the future money divided by one plus the discount rate raised to the t power, $PV = M / (1 + i)^t$).

274. Any discount rate that an individual might have is consistent with thin versions of rational choice theory, so long as the individual does not exhibit inconsistent discount rates. However, if we "thicken" rational choice theory just enough to predict that people will prefer more money to less money (see *infra* Part IV for a discussion of this mildly "thick" assumption) then a negative discount rate is irrational (even though a positive discount rate of any magnitude could be rational). Many taxpayers routinely have too much income tax withheld during the year so that they can receive a refund from the Internal Revenue Service after filing their tax returns in the spring of the following year. This overwithholding constitutes an interest-free loan to the federal government and suggests that the taxpayer has a negative discount rate. The taxpayer would have more money, and would suffer no offsetting losses in utility, if he reduced the amount withheld and invested that extra cash on hand at the risk-free rate of return.

275. Thick versions of rational choice theory that presume wealth maximization predict that all individuals will have the same discount rate: the market rate of return. *See, e.g.*, George Loewenstein & Richard H. Thaler, *Anomalies: Intertemporal Choice*, 3 J. ECON. PERSP. 181, 191-92 (1989) ("The

predicts that any individual's discount rate will be invariant to the length of time for which he must wait for his money. For example, an individual who would prefer $10 today to $11 dollars in exactly one year should also prefer $10 five years from now to $11 six years from now. The interest rate in both cases is 10% per year, and any individual should have a stable preference for earning that rate of return or enjoying earlier consumption. The behavioral science literature demonstrates that this assumption is often false. Rather, discount rates often decline as the date of the reward recedes.[276]

This means that, for many people, preferences between logically identical sets of choices may reverse in a predictable direction as the temporal context of the choice changes. Suppose that an individual is to choose between Project A, which will mature in nine years, and Project B, which will mature in ten years. Suppose, further, that an individual who compares the two projects across all their different dimensions prefers Project B to A. Now suppose that we bring the dates of maturity of the two projects forward while maintaining the one-year difference in their maturity dates. Because discount rates increase as maturity dates get closer, it is possible that the individual's preference will switch from Project B to Project A as the dates of maturity decline (but preserving the one-year difference). If discount rates were constant over time, this switching would not occur.[277] An implication of time-inconsistent discount rates is that "people will always consume more in the present than called for by their previous plans."[278] An individual might plan to save X percent of her salary next year but then decide when she receives it that she prefers to spend it rather than save (thus making appropriate the cliché that money can "burn a hole" in one's pocket).

How the law should respond to time inconsistencies depends on the philosophical question of whether the preferences of an earlier or later period of time deserve more respect.[279] Perhaps the most obvious legal

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standard view is that the market rate of interest, corrected for tax distortions, represents an aggregation of individual time preferences, and is the appropriate social rate of time discounting.").

276. *See id.*; *see also* Uric Benzion et al., *Discount Rates Inferred from Decisions: An Experimental Study*, 35 MGMT SCI. 270 (1989); Richard Thaler, *Some Empirical Evidence on Dynamic Inconsistency*, 8 ECON. LETTERS 201 (1981).

277. *See* RICHARD THALER, THE WINNER'S CURSE 96-98 (1992). Another effect regularly observed in experiments with choice over time is that the discount rate for gains is much larger than the discount rate for losses, what Thaler refers to as "debt aversion." *Id.* at 100. This finding is a close kin of the loss aversion noted above. *See supra* note 231 and accompanying text.

278. *Id.* at 98. Robert Strotz first discussed this myopia, as he felicitously termed it. *See* R. H. Strotz, *Myopia and Inconsistency in Dynamic Utility Maximization*, 23 REV. ECON. STUD. 165 (1955).

279. *Cf.* Loewenstein & Thaler, *supra* note 275, at 186 ("The problem of dynamic inconsistency raises questions about consumer sovereignty. Who is sovereign, the self who sets the alarm clock to rise early, or the self who shuts it off the next morning and goes back to sleep?"). See also the thoughtful discussion of the legal implications of these matters in Posner, *supra* note 30 (showing the

implications of temporal inconsistencies come in the areas of tax and savings policy. In the United States, the Social Security system effectively forces workers to save a percentage of their income for retirement. In addition, the government provides billions of dollars of tax incentives each year to encourage individuals to invest even more of their incomes in retirement savings accounts, such as IRAs, Keoghs, and 401(k) plans. From the perspective of rational choice theory, as traditionally understood, this combination of coercion and subsidies should lead to an inefficiently high amount of savings, because people who would prefer current to future consumption are coerced or bribed to forestall that utility-maximizing current consumption.[280] However, if the forward-looking self that plans to invest is presumed to represent the more stable and consistent preferences of the individual than the present-oriented self that changes course and decides to spend, these policies can give the former self the advantage it needs to win the struggle against its less thoughtful counterpart. Under these assumptions, either forced savings or subsidies to encourage savings could enhance efficiency in the consumption of resources.[281]

Two interesting twists on the problem of time-inconsistent discount rates deserve mention. First, like the length of the time delay, the size of the reward at issue appears to affect discount rates. The general problem is that people perceive the difference between $100 today and $150 in a year as greater than the difference between $10 today and $15 in a year, and thus will exhibit a higher discount rate in the latter case than in the former.[282] That is, many people are willing to wait for the extra $50 in the first instance but not for the extra $5 in the second instance.

Shefrin and Thaler have proposed that the explanation lies in how people take mental account of small and large windfalls. They hypothesize that small windfall gains are put into a mental account that allows for immediate consumption, while large windfall amounts are put into a separate mental account for which there is a much lower propensity for

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legal ramifications of supposing that we each have an impulsive, short-term-focused "child" self and a longer-term, more contemplative "adult" self).

280. *Cf.* Deborah M. Weiss, *Paternalistic Pension Policy: Psychological Evidence and Economic Theory*, 58 U. CHI. L. REV. 1275, 1276 (noting that paternalistic concerns that underlie government support for pension policies are "difficult to reconcile with the assumptions that underlie economic analysis"). Requiring or subsidizing savings could still be socially efficient under the assumptions of rational choice theory if the external costs associated with immediate consumption are large. For example, if too much current spending will lead to destitute retirees whom the state will be forced to support, it might be efficient to encourage savings even if the saving is not utility maximizing to the saver. This analysis might explain minimum savings requirements, such as with Social Security, but it seems implausible to explain the extent to which the U.S. tax system subsidizes retirement savings.

281. *Cf. id.* at 1282-83 (noting that Congressional support for pension policies is based on the belief that people are unable to make wise savings decisions for themselves).

282. *See* Loewenstein & Thaler, *supra* note 275, at 187 (explaining that the difference may be attributable to the categorization of small future gains as foregone consumption but large future gains as forgone interest).

immediate consumption. Thus, the opportunity cost of waiting for a small windfall may be perceived to be foregone consumption. But the opportunity cost of waiting for a large windfall will be foregone interest or investment. If foregone consumption is more difficult to resist than foregone interest or investment, that would explain the observed effect of the size of the award causing a decline in the discount rate.[283] If Shefrin and Thaler's motivational explanation is correct, it suggests that the forward-looking selves of the wealthy are more likely to prevail in the battle with their present selves than the forward-looking selves of the poor. This could counsel for differentially focusing subsidies for savings on the poor and middle class.

Second, in an interesting application of the status quo bias, individuals' discount rates have also been shown to vary when experimenters manipulate the reference point from which consumption versus savings choices are evaluated. In one experiment, for example, Loewenstein provided subjects with gift certificates to a record store that could be redeemed at one of a variety of specified future dates. He then elicited from the subjects how much the value of the certificate would have to be enhanced for them to agree to wait longer to redeem it, and how much of the value of the certificate they would be willing to give up in order to be permitted to redeem it earlier.[284] No matter how distant the initial redemption date, subjects demanded more than twice as much to delay that date than they were willing to forego to speed up the redemption date by the same amount of time.[285]

One general consequence of this is that, if it so desires, the government can probably encourage the conservation of benefits it distributes by framing them as redeemable at a certain price in a specified future year, or at an increased price at an earlier time, rather than a given price at the earlier time or a decreased price in a future period. For example, the status quo bias in temporal decision making suggests that conservation might be better served by the government's transferring valuable rights to harvest timber on federal lands to a lumber company in the form of (1) a certain number of acres each year or (2) fewer acres if the company prefers to harvest the trees sooner, rather than in the form of a (1) total number of acres or (2) more acres if the company agrees to spread out its harvesting over time.

The problems raised by time-inconsistent discount rates can be seen as a specific example of a larger issue, sometimes called the "multiple

283. *See* Hersh M. Shefrin & Richard H. Thaler, *The Behavioral Life-Cycle Hypothesis*, 26 ECON. INQUIRY 609 (1988).

284. *See* Loewenstein & Thaler, *supra* note 275, at 187-88.

285. *See id.* at 188 tbl.1.

selves" problem.[286] Each individual, at any given point of time, might not be the unitary, coherent set of preference orderings imagined by rational choice theory. Rather, each individual may be viewed as a collection of competing preference orderings. If so, then there may be a collective action problem in aggregating the contemporaneous preferences of these multiple selves.[287]

While innate judgment, experience, and age may play important roles in achieving coherence among multiple selves, the law, too, might contribute. For instance, where there is general agreement about which aspects of the competing preference orderings within an individual ought to be encouraged, then law can construct policies that give the more desirable "self" an upper hand in determining the individual's course of action. The multiple-selves problem is potentially troubling with regard to every decision, but we use the example of the choice between present and future consumption to illustrate the issue. A stiff tax on cigarettes, to take an obvious example, can be viewed as aiding the future-oriented self in its battle with a more present-oriented self that values immediate gratification over long-term health.[288] Rules that promote or impede efforts of individuals to make future commitments are another means by which lawmakers can lend support to a particular "self." Today's self can attempt to make commitments that either will completely bind tomorrow's self or, at least, raise the cost of taking action that today's self wishes to avoid. A parent might wish to establish a spendthrift trust for a child as a method of stifling a potential future urge to spend the money on immediate consumption. A healthy person might wish to pen an "advanced directive" that specifies the type of treatment he wishes to receive in the event of future illness. Thomas Schelling reports that a drug clinic in Denver uses "self-blackmail" as part of its rehabilitation of drug addiction.[289] The client writes a self-incriminating letter, which the clinic will mail to designated addressees if

286. *See generally* Posner, *supra* note 30 (describing a host of policy problems presented by conceiving the individual as a collection of personal preferences rather than as a unitary set of preferences).

287. A "collective action problem" arises when the high costs of coordinating action among a group of people prevent them from achieving some collective goal. For example, everyone might agree that they would be collectively better off if everyone reduced their stock of weapons. But few individuals are willing to dispose of their arms unless everyone else does so, too. These individuals may need the help of an outside party such as the government to craft an agreement that can compel and enforce the arms reduction. Robert Frank describes another interesting example of a collective action problem: the race to purchase more conspicuous consumer goods so as to signal one's social status, a race that he argues can only be stopped by a consumption tax. *See generally* ROBERT H. FRANK, LUXURY FEVER: WHY MONEY FAILS TO SATISFY IN AN ERA OF EXCESS (1999). We discuss these issues further *infra* Part IV.C.

288. *See* Posner, *supra* note 30, at 20 (explaining that rational actors may overvalue present pleasure with respect to future pain by viewing individuals as a series of rational selves, each with its own interests).

289. *See* Schelling, *supra* note 77, at 7 n.4.

the client fails in his rehabilitative efforts. For instance, a physician might write such a letter to the State Board of Medical Examiners confessing that he has violated state law and professional ethics by using cocaine and deserves to lose his medical license.[290]

Should the law enforce trusts or advanced directives that the actor wishes to make "irrevocable" at the time of establishment if he later changes his mind? Should the rehabilitation clinic face liability if it refuses a request from a relapsed drug addict to return his self-incriminating letter? The proper answer to these questions might rest, at least in part, on whether we believe that the present self or the future self best represents the preferences of the single individual. In all likelihood, this will have to be a situation-specific judgment. We might believe, for instance, that tomorrow's self should prevail over today's self when the issue is health care choices. This is because tomorrow's self will have more available, relevant information than today's self, since today's self is healthy. But it is possible that our judgment might be different when we consider the parent who wishes to form a spendthrift trust for his child.

E. Sunk Costs

One of the most famous dictates of expected utility theory is that irreversible past actions should not influence current choices.[291] Since actors are expected to make choices based on their net expected outcomes, and since irreversible past actions cannot affect that calculus, "bygones" should be "bygones." For instance, a supplier, in making a decision about whether or not to expand production today, should focus solely on the profit potential less the variable costs of that expansion and ignore any fixed costs previously incurred. A person should not stop at the gym on the way home from work merely because he has paid a hefty annual membership fee; he should stop only if he expects that the utility derived from a workout will exceed the utility derived from getting home earlier.

Notwithstanding economic wisdom to the contrary, people routinely cite sunk costs as a reason for pursuing a particular course of action. People choose to attend the theater or an athletic event when they would prefer not to on the ground that the sunk cost of the ticket would otherwise be wasted. Consider the following famous experiment by Richard Thaler.[292] Thaler advertised a $3 "all-you-can-eat" lunch at a local pizza restaurant near Cornell University in Ithaca, New York. He then collected the admission price from enough customers to fill every table in the restaurant and

290. *See id.*

291. *See, e.g.*, POSNER, *supra* note 26, at 7-8.

292. *See* RICHARD H. THALER, QUASI RATIONAL ECONOMICS 11-13 and especially 12 n.8 (1991); Thaler, *supra* note 228, at 39; *see also* ROBERT H. FRANK, MICROECONOMICS AND BEHAVIOR 13, 226-27, 231-32 (1991).

remitted the $3 admission price to half the customers, selected randomly.[293] Rational choice theory would predict no significant difference between the amounts of pizza consumed by those who did and those who did not receive a refund, but Thaler observed a significant difference. Diners who received a refund ate less,[294] presumably because they had no need to justify the cost of the meal.

In some instances, an actor's failure to ignore sunk costs might constitute what could be called a decision-making "error"—the actor fails to recognize that as a factual matter sunk costs don't affect relative outcomes of choices—but such behavior might also serve as a useful heuristic or sensible precommitment device. People often pay heed to sunk costs because they want to act consistently.[295] And while the desire for consistency can be foolish in the face of changed circumstances, it can also be quite sensible when our past actions are based on reliable evaluations of costs and benefits.[296] By purchasing a ticket to the opera in advance, we might send a signal to our future self that we would gain a great amount of utility from attending the performance, obviating the need to conduct a cost-benefit analysis on the day of the performance, when we might be tired, overworked, or distracted. In either case, the failure to ignore sunk costs can cause an actor in particular cases to make choices that do not maximize expected utility, such as when he uses his prepaid opera ticket even though he would derive more satisfaction from pursuing a different activity that evening.

The propensity of actors not to ignore sunk costs could serve as a valuable asset to legal policymakers seeking to encourage socially desirable conduct. One principle might require prepaid copayments for government-subsidized services with positive externalities. For example, Medicaid benefits might be conditioned on a small prepayment by beneficiaries for preventive medical services with public health implications, such as immunizations, thus using the sunk cost principle to encourage beneficiaries to take advantage of subsidized immunizations. Or payments for education might be paid prior to a course of study, rather than on a periodic basis, so as to induce the payer to feel compelled to "get his money's worth."[297]

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293. *See* Thaler, *supra* note 228, at 48 n.8.

294. *See id.*

295. *See* ROBERT B. CIALDINI, INFLUENCE: SCIENCE AND PRACTICE 50-93 (3d ed. 1993).

296. *See id.* at 52-53 (observing that consistency "allows us a convenient, relatively effortless, and efficient method for dealing with the complexities of daily life that make severe demands on our mental energies and capacities").

297. It should be obvious that these devices are also available to, and indeed, frequently used by, private parties, as demonstrated by the examples of opera tickets, fitness center memberships, and the like.

The sunk cost fallacy might also have private law implications. Sellers, especially of consumer goods, often structure contracts such that the buyer is obligated to make monthly payments but can stop making payments and return the merchandise at any time. These deals, we believe, are often conscious attempts to take advantage of commitments to sunk costs. Once the first monthly payment is made, the purchaser is unlikely to discontinue the contract and return the merchandise, even if the marginal cost of keeping the merchandise is higher than the marginal benefit he receives from it. To the extent that lawmakers believe that such contracts result in many consumers' failing to maximize their utility, those lawmakers might consider implementing restrictions on the way consumer contracts may be structured.

IV
DEVIATIONS FROM SELF-INTEREST

Parts II and III of this article have presented evidence that even thin conceptions of rational choice theory, as exemplified by the expected utility version, are implausible as behavioral descriptions of general applicability. But, as has been mentioned, thin versions of rational choice theory face an additional problem: because they contain no theory of the goals or preferences of a decision maker, they have little predictive value. Even if actors did make all decisions consistent with the complete cost-benefit analysis implied by expected utility theory, policymakers would have no basis for predicting what behaviors would result from changes in legal policy. To make rational choice theory useful for legal policy, it must contain some prediction about actors' "ends," not merely predictions about the "means" they will use to achieve them.

The most mild, and generally unobjectionable, predictions about actors' substantive preferences are whether actors will view a certain item as a "good" or a "bad." These predictions are, in fact, so mild and unobjectionable that they are almost always implicit and usually not even recognized as predictions about preference structures at all. For example, law-and-economics analysis always assumes that people will view money as a "good," which means that they will prefer more of it to less. The opposite prediction is made about actors' perception of time in prison: this is always understood to be a bad, meaning that actors will prefer less prison time to more.

Classifying items as "goods" or "bads" provides enough "thickness" to rational choice theory to permit some simple predictions to be made. For example, assuming money is a "good" leads to the prediction that raising taxes on an item will result in reduced sales. Assuming that prison time is a "bad" leads to the prediction that increasing the severity of prison sentences will cause a reduction in crime. Unfortunately, a "thicker" theory of

preferences is necessary for rational choice theory to lead to more precise and sophisticated predictions. In an effort to generate behavioral predictions, rational choice theory is often understood in law-and-economics scholarship to predict that actors' utility functions will be based entirely on what is in their self-interest. This statement can incorporate all action simply by adopting a tautological definition of "self-interest" as being any act or thing that gives well-being to the actor. On this reading, there are no acts contrary to self-interest. Even a seemingly selfless act is, when examined critically, really an act that confers benefit to the actor precisely by conferring uncompensated benefit to another (or else it is done in hopes of getting something in return). Understood this way, the "self-interest" version of rational choice theory is no different from the "expected utility" version: that is, it contains no theory of the actors' preferences or goals, and it can lead to few if any predictions about future behavior.

For the "self-interest" version of rational choice theory to achieve the "thickness" necessary to have predictive value, it must go out on a limb and specify certain substantive behaviors, capable of observation, that would be inconsistent with the theory. For the sake of predictive value, rational choice theory as applied to law often is based on the prediction, be it implicit or explicit, that actors will seek to maximize their selfish interests. Although we applaud attempts by legal scholars to make predictions about how actors subject to the laws will respond to legal rules and institutions, the "self-interest" version of rational choice theory makes predictions that are grossly implausible as a general matter. This Part examines a few reasons why the predictions are implausible—because people act in accordance with social norms,[298] because they value fairness,[299] and because they contribute to public goods[300]—and examines some of the implications of these findings for legal policy.

A. *Social Norms*

It should not be controversial to assert that individuals' behavior is often informed by social norms, defined as social attitudes that specify what behaviors an actor ought to exhibit.[301] For this statement to contradict the thick version of the rational choice theory, it must be the case that in some circumstances the behavior that results from compliance with social norms differs from the behavior that rational self-interest would dictate. When two pedestrians approach each other head on, they each may comply with a social norm of stepping to the right, but complying with the norm is

298. *See infra* Part IV.A.

299. *See infra* Part IV.B.

300. *See infra* Part IV.C.

301. *See* Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903, 914 (1996) (defining social norms as "social attitudes of approval and disapproval, specifying what ought to be done and what ought not to be done"); *see also* ERIC A. POSNER, LAW AND SOCIAL NORMS (2000).

consistent with self-interested behavior. Consider, however, the following three examples of norm-conforming behaviors that are problematic for thick versions of rational choice theory.

First, to borrow a comparison made by Robert Cooter,[302] a man might remove his hat when he enters a furnace room and when he enters a church, but the two acts are different in an important way. In the furnace room, the man prefers to take off his hat rather than keep it on. By removing it, he acts in accordance with his self-interest. In the church, the man presumably prefers to leave his hat on (at least we can assume as much if he leaves his hat on inside other buildings), but he removes it in deference to a social norm that men do not wear hats in churches.

Second, consider how a self-interested decision maker would approach the decision of whether or not to tip his server in a restaurant. Tips are usually left after the meal, and are presumably withheld until that time to create an incentive for the server to perform well.[303] A diner may enjoy good service without leaving a tip, but this carries some risks to even the self-interested diner who might someday return to the restaurant (what kind of service could he expect then?).[304] However, a self-interested diner should certainly not leave a tip if he never intends to visit the restaurant again.[305] The overwhelming weight of the evidence, however, suggests that (at least in the United States) almost all diners do tip, even when they are traveling far from their hometowns and are extremely unlikely ever to return to the establishment,[306] thus creating a significant anomaly for the self-interest version of rational choice theory.[307]

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302. See Robert D. Cooter, *Decentralized Law for a Complex Economy: The Structural Approach to Adjudicating the New Law Merchant*, 144 U. PA. L. REV. 1643, 1656 (1996) [hereinafter Cooter, *The New Law Merchant*]; Robert Cooter, *Normative Failure Theory of Law*, 82 CORNELL L. REV. 947, 954 (1997) [hereinafter Cooter, *Normative Failure*].

303. Notice that a part of this rational choice view of tipping is that, in the absence of *ex post* payment in the form of a tip, there would be little incentive for the server to perform well. The price of the meal, that is, would be invariant to the quality of the service, unless there were some other mechanism (as, say, between the restaurant owner and the employees) to compel quality service. A humorous cartoon in the *New Yorker* magazine suggests an even better method of inducing good performance: on the table in front of a solitary diner is a "plate with a few coins on it and a small placard reading, 'Your tip so far.'"

304. *See generally* William Grimes, *Tips: Check Your Insecurity at the Door*, N.Y. TIMES, Feb. 3, 1999, at B1, col. 3 (describing scholarly research on how people behave in situations where tipping is expected or appropriate).

305. In an attempt to explain puzzling (that is, nonrational) behavior, economist Steven Landsburg concedes, "I do not know why people leave anonymous tips in restaurants." LANDSBURG, *supra* note 6, at 19; *see also* Jolls et al., *supra* note 13, at 1492-93 (discussing the phenomenon of out-of-town tipping).

306. One might also speculate about the behavior of the rational server in these circumstances. Presumably, a rational server would recognize that an out-of-town guest would be far less likely to be a repeat customer and, therefore, far more likely not to tip. To prevent disappointment that might occur to the server who works diligently for a customer in the hope of handsome *ex post* compensation only to find that the customer is not going to so compensate him, a rational server might greet each customer in some artful way designed to discover whether the patron is from town or out of town. The very fact

Finally, Robert Ellickson's now-famous study of actual practices in Shasta County, California, for dealing with damages arising from wandering cattle,[308] provides an in-depth look at the power that social norms can have on behavior. Ellickson found that ranchers and farmers conformed their interactions to a strong social norm of "neighborliness."[309] This norm, as understood locally, required a farmer onto whose property a rancher's cattle had wandered to notify the owner and to care for the cattle until the owner was able to retrieve them, even if this meant housing and feeding the cattle for months.[310] Moreover, the social norm discouraged the farmer from asking the rancher to reimburse him for the expenses he incurred in caring for the cattle (although some ranchers paid reimbursement voluntarily).[311] To evaluate whether the observed behavior was consistent with a farmer's self-interest, one would have to know something about the legal rights of farmers who were victimized by trespassing cattle. The most surprising finding of Ellickson's study was that ranchers and farmers in Shasta County had little knowledge about the law of wandering cattle, and, more importantly, they had virtually no interest in learning about their legal rights.[312] A person who cares for his neighbor's chattels without knowing whether he has a legal obligation to do so or a right to reimbursement, or even having any interest in knowing his legal rights, can hardly be said to be seeking to maximize his direct self-interest.

Two basic theories are most often offered to explain why people obey social norms, both of which can be seen as rational in a global sense. On one account, people value not only the inherent qualities of actions that they might take but also the esteem, or social approval, of others.[313] Compliance with social norms earns the actor esteem, whereas violation of social norms costs her esteem. In economic terms, social norms can be thought of as providing a subsidy (in the form of positive esteem) for some

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that this does not happen suggests that patrons do not generally intend to "stiff" servers and that servers do not generally expect to be "stiffed."

307. *See* ROBERT H. FRANK, PASSIONS WITHIN REASON: THE STRATEGIC ROLE OF THE EMOTIONS 16-19 (1988).

308. Robert C. Ellickson, *Of Coase and Cattle: Dispute Resolution Among Neighbors in Shasta County*, 38 STAN. L. REV. 623 (1986). The study is expanded in ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991).

309. Ellickson, *supra* note 308, at 673 (explaining that trespass victims do not view errant cattle as trespassers).

310. *See id.* (explaining that a telephone call was the customary response to someone else's cattle straying onto one's property).

311. *See id.* at 674-75 (stating that many ranchers had never heard of anyone's charging or being charged for such boarding).

312. *See id.* at 668-70 (explaining that most ranchers had a limited and oversimplified view of trespass law).

313. *See* Richard H. McAdams, *The Origin, Development, and Regulation of Norms*, 96 MICH. L. REV. 338, 355-56 (1997) (assuming that people seek the esteem of others).

behaviors while imposing a tax (in the form of negative esteem) for others.[314]

Thus, when we see a man remove his hat in church, we might interpret his behavior as evidence that the utility he enjoys from wearing his hat is outweighed by the negative utility he would suffer (in the form of the loss of esteem) should he fail to remove his hat consistent with social convention. And when we see a diner leave a tip in a restaurant to which he will never return, we might interpret her behavior as evidence that she fears the loss of esteem she would suffer should her friends and neighbors learn that she failed to tip her server. This theory suggests that actors' reliance on social norms bears a certain relationship to the problems of bounded rationality discussed in Part II: obeying social norms, like adopting simplified decision strategies and relying on decision-making heuristics, might be a "globally" rational strategy but has the consequence of causing individuals to make decisions that are not locally optimal.

A competing view posits that people obey social norms that are contrary to their direct interests because actors internalize the norms of their communities.[315] According to this view, the cost of violating social norms is not loss of esteem in the eyes of peers but guilt or shame for doing something the actor experiences as "wrong" (the benefit to be gained from compliance with social norms can be referred to as "pride"). The costs of violating social norms are imposed not by society but by the violator himself.[316] If a man takes off his hat in an empty church as readily as in a crowded one, his behavior might be better explained by the internalization explanation than by the esteem explanation. Similarly, if a diner tips her server in a restaurant in a community in which she knows no one and which is many miles away from her hometown, we might suspect that internalization is the better behavioral explanation. The internalization theory suggests that obeying social norms bears a relationship to the contextual effects on decision making discussed in Part III: existing norms may be a contextual factor that affects individuals' construction of preferences,

314. *See generally* Sunstein, *supra* note 301, at 935 (stating that norms "help identify the costs and benefits of actions").

315. *See, e.g.*, Robert Cooter, *Expressive Law and Economics*, 27 J. LEGAL STUD. 585, 585-86 (1998); Cooter, *The New Law Merchant*, *supra* note 302, at 1662; Robert C. Ellickson, *Law and Economics Discovers Social Norms*, 27 J. LEGAL STUD. 537, 539-40 (1998).

316. Cooter calls this the difference between "principled" conformity to a norm (conformity caused by internalization) and "adventitious" conformity (conformity caused by the external benefits to be derived). *See* Cooter, *The New Law Merchant*, *supra* note 302, at 1667. Ellickson frames the difference as one between first-party and third-party enforcement of norms. *See* Ellickson, *supra* note 315, at 547.

which rational choice theory presumes to be exogenously determined and fixed.[317]

In many cases, a social norm might derive its power from both the desire for social approval and from internalization.[318] That is, a man might remove his hat in a church and a diner might leave the server a tip because they would fear the imposition of social sanctions and feelings of guilt should they act otherwise. This could make social norms doubly powerful as a determining cause of behavioral choices.

When individual behavior motivated by social norms differs from what would be in the actors' direct self-interest, there are a number of potential implications for legal policymakers. First, the existence of a social norm supporting or undermining a particular desired behavior can affect whether and to what extent policymakers need to employ law to encourage the behavior. Some law-and-economics analysis has concluded that laws prohibiting racial or gender discrimination in employment are unnecessary, because in a competitive market individuals and firms have a strong profit motive to hire the best workers available—in other words, direct self-interest will prevent discrimination, at least in the long run.[319] But in a world in which there is a social norm supportive of racial discrimination, strong legislation imposing penalties for discriminating on such bases, which can be viewed as a discrimination "tax," might be necessary to eradicate this behavior.[320] In other words, law might be used to encourage individuals to violate inefficient or undesirable social norms.[321]

Second, rather than attempting to support or impede social norms, policymakers might attempt to shape social norms through law and other forms of public policy.[322] The primary deterrent effect many laws have on undesirable behavior might not be the direct increase in the price of the behavior through the threat of fines, civil liability, or jail sentences, but the

317. *Cf.* Sunstein, *supra* note 301, at 913 (asserting that "preferences are constructed, rather than elicited, by social situations, in the sense that they are very much a function of the setting and the prevailing norms").

318. *See* Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2031 (1996) (positing that choice depends on the intrinsic utility of the options, the reputational utility of the options, and the effects of choice on the actor's self-conception).

319. Gary Becker has argued for allowing changing social realities to cause a discriminatory norm to erode over time. In his model, those who exercise an unwarranted taste against certain groups bear a cost for doing so and, if there is enough competition in the marketplace in which they are operating, those costs will eventually become too much to bear. Real forces of profit, loss, and utility will cause social conventions to change.

320. *Cf.* Cooter, *Normative Failure*, *supra* note 302, at 977-78 (stating that the law can destabilize discriminatory practices by protecting parties who cease to follow a group's discriminatory norms).

321. *See, e.g.*, Eric A. Posner, *Law, Economics, and Inefficient Norms*, 144 U. PA. L. REV. 1697, 1728 (1996).

322. Cass Sunstein refers to this as "norm management." Sunstein, *supra* note 301, at 907. For an insightful discussion of the difference between law's direct effects on behavior and its indirect effects on behavior through its impact on social norms (and other inputs to behavior), see Lawrence Lessig, *The New Chicago School*, 27 J. LEGAL STUD. 661, 662-72 (1998).

encouragement of a social norm against the activity. For example, by making the use of marijuana a criminal offense, the government raises the price of marijuana use, which undoubtedly decreases such use on the margin, but it also might create or reinforce a social norm against marijuana use that has an even larger effect on behavior. By banning the selling of babies, the selling of bodily organs, or the selling of sex, the government might reinforce a social norm that neither the body nor its parts should be commodified.[323] By making tax evasion a crime rather than a civil violation subject to a fine, the government might cultivate a social norm supportive of taxpaying.[324] Note that these approaches can be successful only in communities generally prone to respect the law.[325] If a subgroup is hostile to expressive statements of law, attempts to manage social norms might have just the opposite effect. For example, if teenagers as a subgroup have a general social norm that favors defying authority, the legal prohibition of marijuana might paradoxically encourage marijuana use among teenagers.[326]

Just as law might encourage the development of a norm opposed to a socially undesirable activity, it might encourage the development of a norm supportive of a desirable activity. Tax subsidies for Individual Retirement Accounts and 401(k) plans might be enacted today to encourage the desired amount of private retirement savings. They also might be enacted in an effort to encourage a stronger social norm in favor of saving for retirement, which could reduce the need for the subsidy in the future.

Perhaps less controversially, policymakers might use the state's power to educate rather than its power to legislate to encourage the development of certain norms. Governmental attempts to disseminate information on the health risks of tobacco consumption might have encouraged the development of a social norm against smoking.[327] Government-sponsored tobacco education is certainly less intrusive than an explicit legal command against smoking or a prohibitive tax on cigarettes, and may have as much

323. *See generally* Margaret Jane Radin, *Market-Inalienability*, 100 HARV. L. REV. 1849 (1987) (arguing for a relatively wide scope for the legal policy of inalienability on the ground that this will preserve desirable social behavior).

324. *See* Dan M. Kahan, *Social Meaning and the Economic Analysis of Crime*, 27 J. LEGAL STUD. 609, 609-10 (1998).

325. *See* TOM R. TYLER, WHY PEOPLE OBEY THE LAW 45 (1990) (citing a study where 82% of respondents agreed with the statement, "People should obey the law even if it goes against what they think is right").

326. *See, e.g.*, Dan M. Kahan, *Social Influence, Social Meaning, and Deterrence*, 83 VA. L. REV. 349, 375 (1997) (noting that "delinquency is status-enhancing" among gang members because willingness to break the law is viewed as a signal of strength and courage); Kahan, *supra* note 324, at 611-12 (suggesting that increasing the severity of punishment for carrying a gun at school might have the opposite of its intended effect by "reinforcing the message of defiance" associated with gun possession); Sunstein, *supra* note 301, at 919 (observing the relevance to legal policy of the fact that "some people like to reject social norms").

327. Government attempts to portray smoking as "uncool" or "dirty" might have a similar effect.

or more of an effect on social norms concerning smoking. The state might also shape norms through its role as a participant in various markets. By implementing nondiscriminatory hiring practices for government employees, for example, lawmakers might encourage a more general nondiscrimination norm.[328]

Third, although there is no undisputed theory of how social norms develop or change,[329] some commentators have hypothesized that the existence of a norm favoring a certain behavior might be evidence that this particular behavior is more efficient than alternatives,[330] or at least more efficient than alternatives that are likely to be encouraged by lawmakers engaged in political decision making.[331] Unless they have a clear reason to believe a prevailing norm is not efficient, legal policymakers might be wise not to interfere with the norm.[332] This principle of non-interference can be operationalized by lawmakers' either not legislating in a given field, thus relying on norms to be self-enforcing, or by codifying the prevailing norms, thus supporting the prevailing norms with the enforcement power of the state. In the area of commercial law, Karl Llewellyn's support for the latter strategy led to the creation of the Uniform Commercial Code, which, to a large extent, attempts to codify commercial trade practices.[333] Lisa Bernstein has argued on behalf of the former strategy, contending that, at least with regard to ongoing, relational contracts, it is wiser policy to leave the enforcement of commercial norms to the commercial

328. *See, e.g.*, Lawrence Lessig, *The Regulation of Social Meaning*, 62 U. CHI. L. REV. 943, 1008-14 (1995); Eric A. Posner, *supra* note 321, at 1730.

329. *Cf.* Ellickson, *supra* note 315, at 550 (admitting that many norms scholars have "ducked" the challenge of creating a theory of norm development and reform, "in effect relegating norm change to a black box").

330. *See, e.g.*, Cooter, *The New Law Merchant*, *supra* note 302, at 1677 (suggesting that efficient equilibria will become norms). Cooter concedes that some norms may develop even though they are inefficient: for example, if the norm of one community enables it to capture benefits while externalizing costs on another community. *See id.* at 1684-85.

331. *See id.* at 1690 ("My view that failures are rare in business games and norms, and that rent-seeking by lobbyists is common, lies behind my claim that much business law should be found, not made, by the state.").

332. In the text accompanying *supra* notes 249-51, we argued that courts ought not to assume that default contract provisions are efficient simply because parties continue to contract for them. This might seem to contradict our argument here that courts should defer to social norms, including, perhaps, contractual default norms. As will become clear in our conclusion to this section, the deference to social norms that we propose is a highly contingent one. Legislators and other legal decision makers might begin from a presumption in favor of deference, but it should not be difficult to overcome that presumption. Similarly, we would argue that our earlier argument in favor of not deferring to contractual norms is also a presumption that can be easily surmounted. In the end, these two positions are much closer than they would otherwise seem to be.

333. *See, e.g.*, U.C.C. § 2-202 cmt. 2 (proclaiming the importance of commercial practice in driving the rules of commercial law); Cooter, *The New Law Merchant*, *supra* note 302, at 1651-52 (noting that Llewellyn's goal in drafting the U.C.C. was to codify best commercial practices); *cf.* Grant Gilmore, *On the Difficulties of Codifying Commercial Law*, 57 YALE L.J. 1341, 1341 (1948) (claiming the U.C.C.'s purpose is to codify commercial law, not to change the habits of business people).

communities themselves and to invoke external legal rules only in rare cases when relationship-preserving norms break down completely.[334] Making a slightly different point, but one that is related in its assumption that norms should be respected by lawmakers, Robert Cooter has argued that law should be used to fill gaps in social norms, yielding to the norms where they exist.[335]

Even if it is true, however, that an emergent norm is likely to be efficient, changed circumstances might render a once-efficient norm inefficient. If the decentralized nature of norms makes them slow to change in response to changing circumstances, policymakers may play a valuable role by enacting counter-incentives and encouraging norm change in response to such changing circumstances.[336]

Because we have taken to task the law-and-economics community for clinging too tightly to the implausible behavioral assumptions of rational choice theory in its traditional conceptions, evenhandedness requires that we give credit where it has exhibited a more flexible reassessment of the rationality assumption. In the last decade there has been an outpouring of literature from within the traditional law-and-economics community on the importance of social norms in understanding human behavior,[337] and we have drawn upon much of this work in this section. If the law-and-economics community embraces to the same extent the other phenomena described in this Article, it will be well on its way to developing a more nuanced and insightful generation of economically minded legal scholarship.

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334. Lisa Bernstein, *Merchant Law in a Merchant Court: Rethinking the Code's Search for Immanent Business Norms*, 144 U. PA. L. REV. 1765, 1796-1815 (1996). Bernstein's claim is that commercial parties will act in accordance with certain norms in the conduct of ongoing business relationships, and that no legal coereion is needed to enforce these norms in such relationships. Legal rules are necessary only when the relationship between contracting parties breaks down. In these cases, rules that are at odds with commercial norms might be more efficient than norms employed in very different circumstances. *See id.*

335. *See* Cooter, *Normative Failure*, *supra* note 302. In a similar vein, Eric Posner argues that "solidary" groups generally are capable of governing themselves through social conventions and that legal intervention typically (but not always) does more harm than good. *See* Eric A. Posner, *The Regulation of Groups: The Influence of Legal and Nonlegal Sanctions on Collective Action*, 63 U. CHI. L. REV. 133, 136 (1996).

336. *See* Avery Katz, *Taking Private Ordering Seriously*, 144 U. PA. L. REV. 1745, 1750 (1996) (noting that social norms might be highly path-dependent and, thus, dependent on historical accident); Posner, *supra* note 321, at 1713 (arguing that information lag affects diffuse groups more than legislatures and judges, suggesting that the latter may produce better rules than the norms created by the former).

337. *See, e.g.*, Symposium, *Law, Economics, & Norms*, 144 U. PA. L. REV. 1643-2339 (1996); Symposium, *Social Norms, Social Meaning, and the Economic Analysis of Law*, 27 J. LEGAL STUD. 537-823 (1998). As David Charny explains, the pervasiveness of "all sorts of conduct that did not seem particularly rational" caused legal economists to investigate how nonlegal sanctions that attached to violations of norms affect behavior. David Charny, *Illusions of a Spontaneous Order: "Norms" in Contractual Relationships*, 144 U. PA. L. REV. 1841, 1843-44 (1996).

B. *Fairness*

One particular social norm—fairness—merits a discussion of its own because it is so fundamentally contrary to the predictions of the self-interest version of rational choice theory. To predict that actors behave selfishly is to predict that unenforced notions of fairness will be ignored. There is considerable evidence to the contrary.

Consider how people play the much-studied "ultimatum game."[338] The game begins with two participants who do not know one another and are not allowed to communicate. Player 1 proposes a division of a monetary stake provided by the experimenter (perhaps $10 or $20). Player 2 then has two choices. He may accept the proposed division, in which case the players receive their proposed shares of the stake. Alternatively, he may reject the division, in which case the stake reverts to the experimenter and each player receives nothing. A self-interested Player 1, it is alleged, should propose a division that provides the smallest possible increment for Player 2 and reserves the lion's share of the stake for himself. Because Player 2 will realize something is better than nothing, he should then accept the proposed division.

Experience has demonstrated that Player 1 rarely proposes the predicted, one-sided division. Rather, in a wide-ranging number of experiments over many years and in many different countries, the modal (that is, most common) proposal is for a 50-50 split, and the mean proposal has been for a 63-37 split.[339] Player 1 will generally offer a less even division if he is selected to be Player 1 on the basis of an apparently objective reason (such as his having answered a preliminary question correctly) rather than as the result of a coin flip, or if the identities of the two players are shielded from each other. However, even in these circumstances Player 1 is unlikely to propose the most lopsided division possible consistent with offering Player 2 a nonzero payout.[340]

This result, while often publicized, is not fatal for the self-interest version of rational choice theory. Player 1 might maximize his expected profit from the game if he correctly fears that Player 2 might reject a grossly unequal proposed division, leaving Player 1 with nothing. Most troubling for rational choice theory are the findings concerning Player 2. Player 2, it turns out, rejects almost 25% of the proposed divisions, with divisions

338. *See, e.g.*, THALER, *supra* note 277, at 21-35; Thaler, *The Ultimatum Game, supra* note 24, at 195; Alvin E. Roth, *Bargaining Experiments*, 282-92, 296-302, *in* THE HANDBOOK OF EXPERIMENTAL ECONOMICS (John H. Kagel & Alvin E. Roth eds., 1995); Werner Guth et al., *An Experimental Analysis of Ultimatum Bargaining*, 3 J. ECON. BEHAV. & ORG. 367 (1982); Jolls et al., *supra* note 13, at 1489-93.

339. *See* THALER, *supra* note 277, at 22-25.

340. *See id.* at 27.

below an 80%-20% split being almost uniformly rejected.[341] Having the final move, he will often choose "nothing" rather than "something," if accepting the something means accepting inequitable treatment. The desire to be treated fairly—perhaps better labeled as "pride"—it seems, can trump self-interest.[342]

It appears that the desire to treat others fairly can cause deviations from self-interested behavior just as the desire to be treated fairly can do the same. Results of the "dictator game" demonstrate this effect. In the dictator game, Player 1 must propose a division of a stake between himself and Player 2, just as in the ultimatum game. Unlike the ultimatum game, however, Player 2 has no choice but to accept the proposed division. In the dictator game, the average Player 1 offers a less-equal division than does the average Player 1 in the ultimatum game, but he still offers, on average, a significant percentage of the stake to Player 2.[343] The effect is reduced if the context is manipulated so that, for example, Player 1 is told there is an objective reason that he rather than Player 2 has the right to determine the allocation, or the "social distance" between the two players is emphasized,[344] but it fails to disappear even if the players' identities remain hidden from one another.[345] It would be naïve to suppose that transacting parties always place fair treatment of a bargaining partner above their own profits, but the evidence suggests that, for many people, self-interest maximization can be somewhat tempered by the affirmative desire to treat others fairly.

The power of the fairness norm has clear implications for any legal rule that relies on assumptions about private bargaining behavior. As one example, consider a contested issue of legal remedies: should entitlements

341. See Daniel Kahneman et al., *Fairness as a Constraint on Profit Seeking: Entitlements in the Market*, 76 AM. ECON. REV. 728 (1986).

342. Steve Lubet provides an excellent example of this phenomenon when he describes a trip his family took to Petra, Jordan. A round-trip horse ride into the center of the bazaar was priced at seven Jordanian dinars. Tourists who wished to walk to the bazaar could bargain with horse drivers for a one-way return trip at the end of the day. To Lubet's dismay, no matter how thin the crowd at the end of the day, no matter how many idle horse drivers, and no matter how hard he bargained, he could not convince a single horse driver to accept less than four dinars for the one-way journey. *See* Steven Lubet, *Notes on the Bedouin Horse Trade or "Why Won't the Market Clear, Daddy?"* 74 TEX. L. REV. 1039, 1039-42 (1996). Lubet reasoned that, because the variable cost of providing the trip was low, a horse driver faced little opportunity cost by accepting two or three dinars for a trip, and transactions were done in secret so other horse drivers could not impose formal or informal sanctions on a colleague who undercut the others on price—consequently, he was flummoxed. *See id.* at 1042-49. His son, however, pointed out that the drivers' pride would be hurt by accepting less than they believed their services were worth. *See id.* at 1050.

343. *See* Roth, *supra* note 338, at 298-302; *see also* Colin Camerer & Richard H. Thaler, *Anomalies: Ultimatums, Dictators, and Manners*, 9 J. ECON. PERSP. 209, 213-14 (1995).

344. *See* Camerer & Thaler, *supra* note 343, at 213-14; Elizabeth Hoffman et al., *Preferences, Property Rights, and Anonymity in Bargaining Games*, 7 GAMES & ECON. BEHAV. 346, 362-65, 370-72 (1994).

345. *See* Roth, *supra* note 338, at 299.

be protected by "property rules" (meaning the owner of an entitlement can invoke an injunction to protect against its taking) or "liability rules" (meaning that a nonowner can take an entitlement from its owner so long as he is willing to pay court-determined damages)?[346] Standard law-and-economics analysis compares the costs of the two alteruatives. Liability rules are problematic because they lead to more litigation (and its attendant costs), and because courts might set the "price" of a taking too low, thus encouraging inefficient takings, or too high, thus discouraging efficient takings.[347] On the other hand, property rules are problematic because transaction costs (and, as we have seen, status quo bias) could prevent efficient transactions from occurring. One prominent transaction cost is the risk of negotiations failing due to the problem of "bilateral monopoly."[348] This problem is best understood with an illustration: in a situation in which there is only one possible buyer of an entitlement and one possible seller, and the buyer is willing to pay $5 million for the entitlement and the seller is willing to sell the entitlement for $3 million, the sale may not occur (even though it would be efficient) if the buyer holds out for a price near $3 million and the seller holds out for a price near $5 million.[349]

The fairness norm hints that the problem of bilateral monopoly may be overstated in the traditional analysis. Reliance on the fairness norm might make the division of a fixed surplus easier to accomplish in practice than traditional theory predicts. The end result might be to strengthen the argument for protecting entitlements with property rules rather than liability rules.[350]

Similarly, predictions about how private parties negotiate underlie law-and-economics analysis of whether the remedy of "specific performance" or "expectation damages" for breach of contract will lead to the efficient allocation of resources.[351] Suppose that Abel has a contract to sell a carton of widgets to Cain, but a third party desires the same widgets.

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346. *See generally* COOTER & ULEN, *supra* note 8, at 103-06; Calabresi & Melamed, *supra* note 241.

347. *See* COOTER & ULEN, *supra* note 8, at 103-05.

348. POSNER, *supra* note 26, at 69 (stating that the "frustration of a potentially value-maximizing exchange is the most dramatic consequence of bilateral monopoly").

349. The possibility that negotiations can fail in these circumstances is frequently attributed to strategic behavior, and was first discussed in Robert Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1, 28 (1982) (explaining that "strategic behavior sometimes results in noncooperative outcomes").

350. Note that, ironically, the fairness norm cuts opposite of the endowment effect, which provides an argument in favor of liability rules over property rules. *See supra* Part V.B.

351. *See generally* COOTER & ULEN, *supra* note 8, at 226-35 (explaining the general equality of specific performance and expectation damages in terms of efficiency); Alan Schwartz, *The Case for Specific Performance*, 89 YALE L.J. 271, 275-76 (1979) (arguing that specific performance should be the proper remedy for breach of contract because the nonbreaching party is never fully compensated); Thomas S. Ulen, *The Efficiency of Specific Performance: Toward a Unified Theory of Contract Remedies*, 83 MICH. L. REV. 341 (1984) (arguing for specific performance as the routine remedy on the ground that it will more efficiently protect the innocent party's expectation).

Court-determined money damages that would make Cain precisely indifferent to Abel's breaching the contract (expectation damages) will encourage Abel to breach if it is efficient to do so and discourage him from breaching if it is inefficient.[352] Abel will choose to breach only if the profit from doing so is enough to pay the requisite damages. The problem is that courts might err in setting the damages amount, encouraging inefficient breaches (if damages are set too low) or discouraging efficient ones (if damages are set too high).[353]

The remedy of specific performance will encourage just the right amount of breach if transaction costs are low. Under this remedy, Abel cannot breach the contract without Cain's permission—that is, an agreement to rescind the contract.[354] If Cain values the widgets at $100 and the third party values them at $150, either Abel will pay Cain between $0 and $50 to rescind the contract (allowing Abel to sell to the third party) or the third party will pay Cain between $0 and $50 plus Cain's costs for Cain to resell the widgets. One problem with specific performance is that Abel and Cain face a bilateral monopoly problem, as would Cain and the third party. Specific performance would fail if neither set of parties could reach agreement on the precise level of payment between $0 and $50. If, however, the fairness norm reduces the likelihood that Abel and Cain, or Cain and the third party, would fail to reach an agreement on how to divide the $50 surplus value created by allocating the widgets to the third party, the argument for specific performance relative to expectation damages becomes stronger.

C. *Collective Action*

In the familiar "prisoner's dilemma game,"[355] two prisoners who are isolated from each other are given the choice between keeping silent (known as "cooperating," for shorthand) or implicating their coconspirator in a crime (known as "defecting").[356] If both prisoners cooperate, each receives a short prison sentence. If both defect, each receives a long prison sentence. If one defects and the other cooperates, the defector is released from custody and the cooperator receives an extremely long sentence.[357] The interesting feature of the game is that each prisoner is individually better off defecting (because each player is better off defecting if his

352. *See* COOTER & ULEN, *supra* note 8, at 238-45.

353. *See id.* at 244 ("The subjective valuation of the buyer [on performance] is difficult for courts to estimate.").

354. *See* Thomas S. Ulen, *Specific Performance, in* NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW, *supra* note 254, at 481.

355. The usual cite for an outstanding analysis of the game is ROBERT AXELROD, THE EVOLUTION OF COOPERATION (1984).

356. *See* COOTER & ULEN, *supra* note 8, at 34-38.

357. *See id.*

coconspirator defects and is also better off defecting if his coconspirator cooperates), yet they are collectively better off cooperating (because both cooperating is superior to both defecting).[358] The result is that self-interested prisoners will always defect, ensuring that each receives a long sentence, rather than the shorter sentence they could have received if both had cooperated.

The prisoner's dilemma, expanded to include more than two players, emerges in public policy debates as the "collective action" problem.[359] Most frequently, the problem concerns the collective provision of a service or good known as a "public good." A "public good" is one that exhibits nonrivalrous consumption and for which the costs to suppliers of excluding nonpaying beneficiaries are prohibitively high.[360] Clean air and national defense are prototypical examples: many people can "consume" them simultaneously, and it is not feasible to exclude from enjoying their benefits those who refuse to contribute to their upkeep. Self-interested actors, if left to their own devices, would refuse to contribute to the provision of a public good, for the same reason that each prisoner in the prisoner's dilemma will defect. If everyone else (or most others) contributes to the public good, the self-interested actor can "free-ride"—that is, enjoy equal benefits without shouldering any of the costs. If no one else (or few others) contributes to the public good, the self-interested actor is still better off not contributing, because the public good presumably does not have enough value to the actor to make it worth paying the cost himself of providing it to all other citizens.[361] If everyone is self-interested, all will refuse to contribute, leaving everyone worse off than if each had contributed his or her share.[362]

The self-interested version of rational choice theory leads to the prediction that no public goods will be produced as a result of voluntary behavior.[363] It follows that an important role of government is to use its coercive powers to guarantee the production of public goods that make society better off than it would be without their production.

There is a good deal of experimental evidence, however, that people do willingly and voluntarily contribute to the production of public goods.[364]

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358. *See id.*

359. *See generally* MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS (2d ed., 1971).

360. *See* COOTER & ULEN, *supra* note 8, at 42 (defining public goods as a commodity with the characteristics of nonrivalrous consumption and nonexcludability).

361. *See id.*

362. *See id.*; OLSON, *supra* note 359, at 2 ("[E]ven if all of the individuals in a large group are rational and self-interested, and would gain if, as a group, they acted to achieve their common interest or objective, they will still not voluntarily act to achieve that common or group interest.").

363. *See* COOTER & ULEN, *supra* note 8, at 42-43.

364. *See generally* THALER, *supra* note 277, at 9-11; John O. Ledyard, *Public Goods: A Survey of Experimental Results*, *in* THE HANDBOOK OF EXPERIMENTAL ECONOMICS 111 (John H. Kagel & Alvin E. Roth eds., 1995).

Consider an experiment sometimes referred to as the "group exchange." A group of people, usually college students, are brought together, and each is given the same sum of money. They are told that they can invest some, none, or all of that money in something called a "group exchange." The decision to invest in the group exchange will be secret. That is, one does not know whether or not the other players have contributed. The group is also told that the game operator will multiply the total sum invested by the members of the group by a number that is larger than one but smaller than the number of people in the group and will then divide the resulting sum equally among all of the group members, whether they have invested in the group exchange or not.[365] These rules make the group exchange into a public good. Because self-interested players can maximize their profits by receiving an equal share of the sum generated by whatever contributions others make, the prediction of rational choice theory is that no one will contribute.[366]

To see the logic of the experiment, suppose that there are five people in the group and that each of them is given $5. If no one contributes anything to the group exchange, then there is nothing for the game operator to multiply and nothing, therefore, for the group to divide. But suppose that only one person contributes nothing and the other four people in our example contribute their entire $5 to the group exchange. Further, suppose that the group operator doubles the resulting $20 to $40 and then distributes that sum equally among all five players. Each, therefore, receives $8. The incremental return to the four players who contributed $5 is $3, but that of the player who contributed nothing is $8. This logic should be clear to all the subjects. As a result, no self-interested player should invest in the group exchange.[367]

Although not everyone contributes to the group exchange in these experiments, a substantial number do. On average, subjects in the experiments contributed between 40% and 60% of their initial sum to the public good.[368] Manipulating certain aspects of the exercise can affect the percentage of their money that subjects will invest in the public good. Increasing the return on contributions to the group exchange increases contributions, as does permitting subjects to communicate with one another

365. *See, e.g.*, THALER, *supra* note 277, at 10-11 (describing the structure of group exchange experiments); Ledyard, *supra* note 364, at 111-112 (same).

366. *See* Ledyard, *supra* note 364 (observing that contributing nothing is a dominant strategy for all players).

367. *See, e.g.*, Ulen, *supra* note 12, at 493 ("The prediction of the theory of rational choice is that no one will invest in the group exchange.").

368. *See, e.g.*, Gerald Marwell & Ruth E. Ames, *Economists Free Ride, Does Anyone Else?: Experiments on the Provision of Public Goods, IV*, 15 J. PUB. ECON. 295, 299 (1981) (finding subjects contribute approximately 50 percent of the sum they are initially given); Ledyard, *supra* note 364, at 172-73 (concluding from the examination of a range of public goods experiments that approximately half of subjects play the game the way rational choice theory predicts and half do not).

prior to making their contribution decisions.[369] The evidence is equivocal as to whether increasing the number of subjects involved in a single group exchange game increases or decreases average contribution levels.[370] Regardless of how the features of the game are altered, the fundamental finding persists: contributions to the public good are well above what rational choice theory predicts. In one study, even economics students (who ought to know better) contributed to the group exchange, although their average contribution rate (20%) was significantly lower than the rate observed for other players.[371]

One explanation of the results, not inconsistent with self-interest, is that novice experimental subjects may not understand the incentives of the game the first time they play it but will learn with experience. In fact, there is evidence that when multiple rounds of the game are played, contributions decline over time, although they never reach zero.[372] But James Andreoni found a surprising twist to this observation, which he called the "restart effect."[373] When he told players that ten rounds of the game would be played, their contribution rates declined over the course of those ten trials. But when he later announced that the same players would play the game for an additional ten trials, the participation rate rose back to the standard 40-60% range before declining again.[374]

The best explanation for this curious effect appears to be that many subjects, perfectly aware of the incentive structures, are initially willing to contribute to public goods, assuming their colleagues will do the same. When others exhibit less-than-altruistic behavior, the initial contributors reduce their contributions (although usually not to zero), but they are willing to optimistically assume again full cooperation among their colleagues when a new game begins. Andreoni's results suggest that contributions to public goods are not purely altruistic in nature—actors expect reciprocal contributions from their colleagues[375]—but that actors will often assume that others will reciprocate, even in the face of experience that might suggest otherwise.

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369. *See* Ledyard, *supra* note 364, at 149-51, 156-58.

370. *See id.* at 151-55.

371. *See* Marwell & Ames, *supra* note 368, at 306.

372. *See* Ledyard, *supra* note 364, at 135-41 (summarizing studies); *see also* R. M. Isaac et al., *Public Goods Provisions in an Experimental Environment*, 26 J. PUB. ECON. 51 (1985); Oliver Kim & Mark Walker, *The Free Rider Problem: Experimental Evidence*, 43 PUB. CHOICE 3 (1984). There are, however, contrary studies that find repetition of the game has no effect on contribution levels. *See* Ledyard, *supra* note 364, at 147 (citing studies).

373. James Andreoni, *Why Free Ride?: Strategies and Learning in Public Goods Experiments*, 37 J. PUB. ECON. 291, 298 (1988).

374. *See id.* at 298.

375. This hypothesis is demonstrated by Rachel Croson. *See* Rachel T. A. Croson, "Theories of Altruism and Reciprocity: Evidence from Linear Public Goods Games" (draft, Nov. 4, 1998) at 14-16 (demonstrating that subjects' contributions to the public good are highly correlated with their *ex ante* predictions of how much other subjects will contribute) (on file with authors).

The evidence suggests that the collective action problem is less pronounced than rational choice theory would predict, although, on the other hand, it certainly still exists to a large degree.[376] The implications for legal policy are, consequently, somewhat subtle. The evidence certainly does not suggest that government should make income taxes or compliance with pollution control laws voluntary, but it does suggest that in marginal cases the costs of coercion designed to ensure collective action might not be justified.

Consider, for example, the problem of littering. Clean streets are another classic public good, as they can be enjoyed simultaneously by a large number of people and it is impossible to exclude free riders from the aesthetic benefits of the streets' cleanliness. Without penalties for littering, self-interested actors may litter in public places (that is, fail to contribute to the public good by cleaning up their trash) because the benefits of not carrying their litter to a waste basket inure entirely to themselves while the costs are externalized onto everyone else who utilizes the public space. In a world filled with self-interested actors, large fines and strict enforcement of anti-littering laws would be necessary to prevent public spaces from becoming trash heaps.

In the real world, some people will litter, but many will not,[377] at least not very often or in very large quantities.[378] As long as enough people do not litter so that others believe the principle of reciprocity requires them not to litter, there is likely to be a stable majority of the citizenry that exhibits such cooperative behavior.[379] This might not provide a justification

376. *See, e.g.*, Robin M. Dawes & Richard H. Thaler, *Cooperation*, 2 J. ECON. PERSP. 187 (1988) (concluding that "[i]t is certainly true that there is a 'free rider problem" . . . [but] the strong free rider prediction is clearly wrong").

377. In one study, approximately one-third of drivers who had flyers placed on the windshield of their cars threw the flyers on the street, while the other two-thirds did not. *See* Robert B. Cialdini et al., *A Focus Theory of Normative Conduct: A Theoretical Refinement and Reevaluation of the Role of Norms in Human Behavior*, *in* ADVANCES IN EXPERIMENTAL SOCIAL PSYCHOLOGY 201, 221-23 (Mark P. Zanna ed., 1991).

378. A caveat: experimental evidence suggests that people are more willing to contribute to a public good if they are part of the group that benefits from it. *See* Ledyard, *supra* note 364, at 164 (reviewing studies). Consequently, we might expect fewer people to litter in their own neighborhoods than in neighborhoods that they do not frequent.

379. That is, there may develop a social norm against littering. *See supra* Part IV.A. Note the similarities between the decision to litter and the decision to leave a tip. Specifically, people are more likely to litter in a distant place in which they know no one than in their neighborhood. Similarly, there is a "tipping" phenomenon associated with public goods and social norms in the social amenities of an urban neighborhood. Social norms may argue for keeping one's property clean and in good repair. If the vast majority of those in an urban neighborhood follow this norm, then they enjoy the public good of high neigbborhood amenity and public order. But if that cooperation with the social norm should fail, then the public amenity of neighborhood cleanliness and the public order can quickly decline, bringing other social problems, such as street crime. James Q. Wilson and George Kelling have argued that one of the surest precursors that a neighborhood is likely to experience rampant crime was the failure to repair broken windows. *See* James Q. Wilson & George L. Kelling, *Broken Windows*, ATLANTIC MONTHLY, March 1982, at 29. Some people may take the observable fact that private and

for repealing anti-littering ordinances,[380] but it might suggest that the costs of strictly enforcing those ordinances (with police specifically assigned to the problem, for example) are not justified by the magnitude of the problem.

CONCLUSION

Legal rules create incentives or disincentives for actors subject to the legal system to act. Thoughtful legal policy must recognize these incentive effects and be responsive to them. The law-and-economics movement has forcefully impressed these points on the legal academy and has consequently been the catalyst of major advances in legal thinking. Further advances borne out of this paradigm, we believe, are largely dependent on the willingness of legal scholars concerned with the incentive effects of law to rethink the behavioral assumptions of rational choice theory, at least in the forms that this theory has traditionally been understood in legal scholarship.

In this Article, we have argued that thin versions of rational choice theory—for example, expected utility theory—are an inadequate basis ou which to rest legal policy because they have little or no predictive value. Further, they are implausible as theories of general applicability for two reasons. First, people are boundedly rational. To save time, avoid complexity, and generally make dealing with the challenges of daily life tractable, actors ofteu adopt decision strategies or employ heuristics that lead to decisions that fail to maximize their utility. Second, people's preferences are affected by context. Choices are not made merely by comparing decision outcomes; situational variables are critical inputs into decision making.

Thick versions of rational choice theory—for example, "self-interest" and "wealth maximization"—adopt expected utility theory as their basis but add to it predictions about actors' substantive goals and preferences—that is, predictions about "ends" in addition to predictions about "means." These versions of rational choice theory reduce the inadequacy problem created by relying on expected utility theory alone, but they add new implausibility problems to those that plague expected utility theory. The self-interest theory predicts that people will act selfishly in the face of community pressures, treat others inequitably when there is no cost to doing so, and fail to contribute to the provision of public goods. Unfortunately for

public property are not being maintained as a sign that other social norms may be unenforced, too, and, therefore, begin to pursue anti-social behaviors.

380. The existence of such an ordinance itself might, in fact, play a role in maintaining the social norm supportive of the observed cooperative behavior. *See* Sunstein, *supra* note 318, at 2032 (noting that littering laws that are lightly enforced might "have an important effect in signaling appropriate behavior").

the theory (but fortunately for hnmanity), all of these predictions are falše—not all the time, but, at a minimum, in some situations relevant to legal policy.

Our contention that traditional conceptions of rational choice theory are flawed in important ways does not suggest that we believe people are "irrational." Most of the observed deviations from behavior predicted by rational choice theory are quite sensible and understandable, and many seem quite rational in a "global" sense, although they result in behavior that violates the predictions of rational choice theory on the more "local" level on which legal scholarship generally operates. Consequently, we do not argue that the edifice of rational choice theory, which underlies so much of legal scholarship, be ripped down. Rather, we suggest that it be revised, paying heed to important flaws in its structure that unduly and unnecessarily limit the development of a more nnanced understanding of how law affects society.[381]

In Parts II through IV of this Article, we describe more than a dozen different flaws in the mighty armor of rational choice theory, as traditionally understood in legal analysis, and we suggest potential legal policy implications of each one of those flaws. We present none of these policy implications as defmitive solutions to legal problems. Rather, they are offered as stakes in the ground that, we hope, will serve as starting points for a new generation of legal scholarship, one that will see "law and economics" transformed into "law and behavioral science."

381. *Cf.* Ellickson, *supra* note 315, at 551 (arguing that evidence of the importance of social norms on behavior has "destabilized" the traditional law-and-economics paradigm but does not require scholars to "throw over the rational-choice model").