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Comment: The Future of Behavioral Economic Analysis of Law

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The Growing Pains of Behavioral Law and Economics

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I. INTRODUCTION

We are at the beginning of behavioral law and economics. We now see only dimly the outlines of the elaborate theory of decision making that is to come. We are like the independent scholars who examined the various parts of a very large animal and then tried to put together their reports to describe that animal; we each have bits and pieces of the elephant but no clear image of the entire beast. But we should not despair. We must remember that this behavioralist discipline is, as scholarly developments go, young. Indeed, the conventional law and economics model, to which behavioral law and economics is, in large part, a reaction, is itself relatively new. Law and economics has only recently established itself as a vigorous area of scholarship, as evidenced by regular courses within law schools, mnltiple textbooks, scholarly conferences, professional organizations, an AALS section, and so on. For instance, the American Law and Economics Association held its first annual meeting in May, 1991. Therefore, we should not be surprised if behavioral law and economics exhibits a degree of awkwardness, lack of focus, some fumbling, and other characteristics of youthfulness. In mitigation, I hasten to add that there are very strong reasons to believe that this particular youth will grow to a vigorous adulthood.

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Nor should anyone be discouraged by the perfectly sensible criticisms that others make of behavioral theories. They are right to be critical and skeptical, and we should be, too. We must undertake the difficult task of persuading them of the value of the behavioral model.

I would make two more preliminary observations about behavioral law and economics. First, it seems to me to be a perfectly natural development within law and economics. The fact that this behavioral science interests legal academics testifies to the great importance and impact that law and economics has had on legal scholarship in the late twentieth century. In fact, I think that the behavioral law and economics literature takes its power from the great influence of the law and economics movement. Behavioral law and economics does not attempt to undo any of the remarkable accomplishments of law and economics. Rather, it is an attempt to refine.[1]

Second, I find it remarkable that this literature is being fleshed out principally in law schools, not in economics departments. One might think that this literature on how people really make decisions should be at the heart of modern microeconomic analysis, and yet most economists are either uninterested or disdainful.[2] I suggest reasons below why those disciplines concerned with non-market choice, such as law, may be more interested in behavioral decision theory than are disciplines that focus on market choices. Legal academics should take great pride that *they* are so deeply involved in

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1. In a recent roundtable discussion among Gary Becker, Ronald Coase, Morton Miller, and Richard Posner, *see* Gary Becker et al., *The Future of Law & Economics*, 64 U. CHI. L. REV. 1129 (1997), and an accompanying article, *see* Richard Epstein, *Law and Economics: Its Glorious Past and Clondy Future*, 64 U. CHI. L. REV. 1167 (1997), the participants agreed that the early and relatively easy phase of law and economics is ending. Evidence of this is what the participants perceived as a slowing down in the rate of new discoveries within the field. As te the future of law and economics, the participants had diverse but not discordant views. Only one of them mentioned behavioral theories as a likely source of future insights in law and economics.

2. Of course, some economists are deeply interested in the behavioral literature. *See, e.g.*, Samuel Bowles, *Endogenous Preferences: The Cultural Consequences of Markets and Other Economic Institutions*, 36 J. ECON. LITERATURE 75 (1998) (reviewing models and evidence concerning the unpact of economic institutions on preferences and commenting on implications); Jon Elster, *Emotions and Economic Theory*, 35 J. ECON. LITERATURE 47 (1998) (discussing the relationship between emotions and behavior in reference te economic theory); Matthew Rabin, *Psychology and Economics*, 36 J. ECON. LITERATURE 11 (1998) (discussing a selection of psychological findings relevant to economics).

This field will not mark the first time that work in law and economics has interested legal academics more than economists. For instance, Coase's article on social cost is the most heavily cited law review article of the late twentieth century, but most economists dismiss the Coase Theorem as a tautology. And while Kaldor-Hicks efficiency is a part of every modern legal academic's stock of knowledge, most Ph.D. students in economics are not entirely sure what that form of efficiency is.

creating new knowledge about human decision making. To the extent that this effort will succeed, as I am confident that it will, the flow of knowledge will be in the opposite direction from what it has been in the last twenty years: from the law to economics.

My purpose in these remarks is not to be a curmudgeon about behavioral law and economics but to be a gentle prod. In doing so, I shall stand back from the particular articles of this Symposium to pick out broader trends in all of them. Part II sounds a few cautionary notes about some brush-clearing and weed-pulling that the new field needs to tend to. Part III suggests some aspects of behavioral law and economics that the papers in this Symposium might have missed or on which they put, in my opinion, insufficient emphasis. Part IV considers the future directions of behavioral law and economics.

II. IDENTIFYING THE PROBLEM CORRECTLY

In doing behavioral law and economics we must be very careful to distinguish *environmental* and *structural* problems[3] from *cognitive limitations*. Both can make problems for legal decision makers, but in very different ways that may require different correctives. Traditional law and economics and microeconomic theory have long recognized environmental and structural problems as causes of problems for rational actors and have long known what to do to correct those problems.[4] Microeconomic theory typically refers to these conditions as "market failure." Indeed, identification of market failure problems (although they may not involve explicit market transactions) and of their legal correctives has been the core contribution of law and economics to legal scholarship. In contrast, the identification

3. By "environmental" and "structural" I mean the circumstances surrounding the rational actor—for example, the "contractual environment" (e.g., whether there are a few or many consumers and suppliers) and the "structure of the interaction" (e.g., whether there is informational asymmetry or complete information or whether there are principals only or agents acting on behalf of others).

4. But there is a distinction worth noting here between these problems and those arising from cognitive limitations. Environmental and structural problems do not cause decision makers to behave irrationally. Rather, they drive a wedge between what is socially optimal and what is individually optimal. To take an example, a rational consumer may purchase goods from a monopolist. He has no choice, other than to forgo consumption of that good altogether. But society suffers an efficiency loss from the fact that the monopolist, who is a rational profit-maximizer, produces too little and charges too much. Generally speaking, the corrective for environmental and structural problems is te align social and individual incentives for optimality.

of cognitive limitations or information-processing problems and of their legal correctives will be the core contribution of the behavioral law and economics literature.

To be as clear as possible, I mean to say that decision makers may make sub-optimal decisions for two very different sorts of reasons:

- the environment in which they act or the nature of the decision they are to make creates predictable social difficulties beyond the ability of rational actors to control, and
- the decision makers cannot deal cognitively with the situation in a socially or individually optimal manner.

This distinction is important because the legal or other social policy correctives may differ for these two different classes of problem. The law can go astray if it does not properly match the problem with the solution. I consider these sources of socially sub-optimal decisions in more detail below and then compare the very different correctives.

At least five environmental or structural situations (or situations of market failure)[5] present problems of aligning decision making by rational individual actors with social optima:

- collective action,
- external costs and benefits,
- public goods,
- informational asymmetries, and
- strategic behavior.

I briefly discuss how three of these situations—collective action, informational asymmetry, and external costs and benefits—present problems for rational actors and how the law might assist them to deal with those problems. I then distingnish these problems and their correctives from those of cognitive limitation.

Collective action or social choice problems arise when individuals innst aggregate their individual choices into social choices. The most elegant statement of this problem, the Arrow Impossibility Theorem, states that there is no inechanism for aggregating individual preferences about social issues into a collective choice that does not violate at least one of five minimal assumptions about what would be an acceptable method of collective decision making.[6]

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5. One might add "monopoly or monopsony" to this list.

6. The five assumptions are worth repeating because they are so easy to accept: (1) there is no dictatorship—i.e., no one person's preferences detormine the group choice; (2) each individual has ordered all the alternatives according to her preferences and votes for that policy, social welfare function, or candidato that ranks highest in her preference ordering; (3) if every individual unanimously agrees on an alternative, then that alternative is indicated as the

Robert Rasmussen discusses an example of a collective action problem in his contribution to this Symposium.[7] Suppose that a business organization in economic distress has numerous creditors, some of whom are secured, some of whom are not. As the likelihood of business failure rises, the creditors may have an incentive to grab the valuable assets of the organization, so as not to be left empty-handed if the business liquidates. Collectively, the creditors would probably be better off if they liquidated the firm's assets together and received a pro rata share of the value of the assets or if they stayed their grab for assets so as to allow the business to reorganize and, presumably, return to profitability. But each creditor's concern for her own well-being may outweigh her concern for the greater, but speculative, good that would result from receiving a pro rata share or preserving the organization's ability to do business.

This problem does not arise because of some failure in the cognitive abilities of the actors, a point that Professor Rasmussen recognizes. The creditors' grab for assets is a perfectly rational response to a coordination problem. A legal corrective would create credible and consistent incentives for the creditors to solve their collective action problem. This justification accounts for how the Bankruptcy Code deals with the race for valuable assets among rational creditors of a failing business.[8]

Rational actors have difficulties with another structural problem: severe informational asymmetries. For example, a rational seller of property has little incentive to reveal latent defects to a potential buyer because knowledge of the defect will reduce the amount the buyer is willing to pay. The rational buyer should, perhaps, inquire about latent defects, but he should recognize that the seller may have an incentive not to be fully truthful. Law can help in this situation by compelling the seller to disclose knowledge of latent

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society's preference; (4) each individual's choices are complete, transitive, and reflexive; and (5) the preferences between any two candidates or policies depend on how people rank those two alternatives, not on how they rank other alternatives (this proposition is known as the "axiom of the independence of irrelevant alternatives"). *See* KENNETH J. ARROW, SOCIAL CHOICE AND INDIVIDUAL VALUES (2d ed. 1963).

For a more complete discussion of the Theorem and its implications for issues of constitutional law, see generally Thomas S. Ulen, *An Economic Appreciation of the Bill of Rights: The Limits and Potential of Law and Economics in Discussing Constitutional Issues*, 1992 U. ILL. L. REV. 189.

7. *See* Robert K. Rasmussen, *Behavioral Economics, the Economic Analysis of Bankruptcy Law and the Pricing of Credit*, 51 VAND. L. REV. 1679, 1682-83 (1998).

8. *See generally* THOMAS H. JACKSON, THE LOGIC AND LIMITS OF BANKRUPTCY LAW 12-14 (1986).

defects (and to learn of them by making him liable for correcting latent defects of which he should have known).[9]

But the law tolerates some informational asymmetries, and some it even protects. For example, the law generally allows those who have made a reasonable investment in acquiring information—about, say, the location of valuable mineral deposits—to profit from that knowledge without having to disclose it to other parties to a transaction. Doing so maintains an incentive for future parties to make socially beneficial investments in information acquisition. Again, these issues of informational asymmetry affect rational actors; they are *not* attributable to cognitive limitations.

External costs and benefits are the market-failure problems on which law and economics has focused. For instance, the field has viewed tort liability as a system to force potential injurers to "internalize" costs that their conduct might impose on others.[10] The absence of legal compulsion might create an incentive to take socially insufficient care. There is nothing irrational about failing to take care if one does not bear the appropriate cost of that failure. So, if we believe that potential wrongdoers are not taking the correct amount of care, the legal corrective may be to make the "price" for that conduct higher, lower, or more certain.[11]

I asserted above that market failure and cognitive limitations point to very different legal correctives. To see the difference, suppose there are two parties who might engage in a bargain but have not. Is the failure to transact due to high transaction costs, the absence of a cooperative surplus, the presence of irresolvable strategic behavior by the bargainers, or the status quo bias?[12] If the problem is the lack of a cooperative surplus, there can be no bargain, and the law should not force one to occur. If the problem is high transaction costs, perhaps the law should seek to reduce those costs; if the problem is strategic behavior, the law should guard against overreaching; and if the problem is the status quo bias, then the law should be very careful in the initial assignment of entitlements.

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9. Some controversy exists about the efficiency of the rule of mandated disclosure, largely because of problems of where to draw the line: Must the seller disclose knowledge of all or only some latent defects? And if only some, which ones?

10. *See, e.g.*, ROBERT D. COOTER & THOMAS S. ULEN, LAW AND ECONOMICS 270-94 (2d ed. 1997) (discussing an economic theory of tort liability).

11. It could also be that the law is assessing liability on the wrong basis—e.g., it determines liability using negligence where it should use strict liability or vice versa.

12. *See* Russell B. Korobkin, *The Status Quo Bias and Contract Default Rules*, 83 CORNELL L. REV. 608 (1998) (discussing generally those factors identified by law and economics theorists as responsible for parties' failure to contract).

To take another example, suppose that many drivers are not wearing safety belts, causing more injuries than is socially desirable. One source of the problem may be that otherwise rational drivers lack information about the benefits of seat belts. If so, the government might advertise the true benefit of seat belt use, introduce criminal penalties for failure to wear seat belts, or enforce the "seat belt defense" in private tort litigation involving motor vehicle injuries.[13] All of these correctives are consistent with the standard market failure analysis of law and economics.

Alternatively, drivers may not wear seat belts because they suffer from one of the cognitive limitations identified in the articles in this Symposium. For instance, they may be overoptimistic about their abilities as drivers, or they may not have readily available evidence of the value of wearing seat belts, such as a friend's having recently had a serious accident.[14] If these cognitive limitations cause people to take insufficient care, an appropriato social corrective may take the decision about safety restraints out of the hands of the drivers and passengers and mandate the installation of passive restraints (such as air bags) that operate independently of any judgment made by those in the motor vehicle.

Correcting a social problem requires that we identify its cause. Behavioral law and economics identifies a new set of causes for social ills and, with those, a new set of correctives. But we must match the problem to the solution. Rational actors have problems distinct from those due to cognitive limitations. We must be sensitive to those differences and craft our analyses appropriately.

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13. That defense would allow the plaintiff to recover only the losses he would have suffered if he had been wearing a seat belt. *See* Spier v. Barker, 323 N.E.2d 164, 167-68 (N.Y. 1974) (discussing the "seat belt defense").

14. This is an example of the availability heuristic, which holds that people use readily available information rather than verifiable information to estimate the likelihood of an uncertain event. For example, in deciding whether to smoke cigarettes for pleasure and to chance the adverse health consequences of smoking, people frequently use easily available information about the health hazards of smoking—such as whether anyone in their family has suffered ill health because of cigarette smoking. The use of such information is not necessarily wrong or insufficient, but it can be. *See* SCOTT PLOUS, THE PSYCHOLOGY OF JUDGMENT AND DECISIONMAKING 121-30 (1993).

III. BROADENING THE ANALYSIS

In this Part I deal with two important topics that the papers in the Symposium have treated inadequately in their analyses of cognitive limitations—social norms and regulation by statute or administrative agency. None of the papers in this Symposium has mentioned one of the most hotly debated topics in law and economics today—social norms.[15] Social norms, which operate largely beyond conscious control, may solve some of the issues of cognitive limitation that the authors have here identified. To the extent that they do, there is less need for the law to correct for those problems.[16]

As an example, consider one of the most frequent criticisms of law and economics—that it ignores issues of fairness and favors purely self-interested solutions. Law and economics tends te favor unmediated bargaining solutions in allocative decision making.[17] But deemphasizing equitable consequences in the economic analysis of law may not be a shortcoming.[18] There is a strong tendency in human

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15. *See generally* ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991) [hereinafter ORDER WITHOUT LAW]; Robert D. Cooter, *Normative Failure Theory of Law*, 82 CORNELL L. REV. 947 (1997) (focusing upon aspects of a comprehensive social norm theory suitable for economic analysis); Robert C. Ellickson, *Of Coase and Cattle: Dispute Resolution Among Neighbors in Shasta County*, 38 STAN. L. REV. 623 (1986) [hereinafter *Coase and Cattle*] (reporting the results of an investigation into how a California county resolves livestock trespass disputes); Jon Elster, *Social Norms and Economic Theory*, 3 J. ECON. PERSP. 99 (1989) (contrasting social science theories and discussing economists' attempt to reduce norm-oriented action to optimizing behavior); Symposium, *Law, Economics, and Norms*, 144 U. PA. L. REV. 1643 (1996) (challenging some widely held understandings of rationality, choice and freedom to develop); Richard McAdams, *The Origin, Development, and Regulation of Social Norms*, 96 MICH. L. REV. 330 (1997) (articulating an "esteem" theory of norms in legal economic analysis); Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903 (1996).

16. Sunstein, *supra* note 15, at 905-06, argues that, for example, a clever campaign has succeeded in developing a norm against cigarette smoking among African-American teens. A much smaller fraction of African-American teenagers (4.4 porcent) smoke than do white teenagers (22.9 percent). In large part this is attributable to a very successful advertising campaign directed at making African-American teenagers believe that there is a white conspiracy to get them to smoke. The telling advertising phrase is, "They used to make us pick it. Now they want us to smoke it." *Id.* at 906. Sunstein also believes that government and other groups in society can manufacture norms to achieve social ends. One should also recognize that some social norms may conflict with what the society seeks to achieve, so that law and social norms may be in conflict. For example, a norm of not associating with members of another ethnic group would clearly conflict with what society aspires to achieve. Social norms may also supplement the law and other conscious social devices in dealing with collective action problems, strategic behavior, and so on.

17. In his contribution te this Symposium, Professor Ed Rubin caricatured these decisions as defining a realm of social intoraction in which matorial self-interest is paramount. *See* Edward L. Rubin, *Putting Rational Actors in Their Place: Economics and Phenomenology*, 51 VAND. L. REV. 1705, 1715-16 (1998).

18. For a survey of the issues, see generally Russell B. Korobkin & Thomas S. Ulen, *Efficiency and Equity: What Can Be Gained by Combining Coase and Rawls?*, 73 WASH. L. REV. 329 (1998) and the literature cited therein.

interactions to favor fair solutions in cooperative bargaining problems. Economists have conducted many experiments in which bargainers have an opportunity to split a windfall gain and choose to do so fairly. The best-known examples occur in the ultimatum bargaining game. In that game two players do not meet but interact through computer terminals. They split a sum of money (say, $20), with one of the players making a proposal for division and the other player either accepting it, in which case the players actually receive the proposed division, or rejecting it, in which case neither of the players gets anything. Economists predicted that the first player would reason that if he proposed a lopsided division of the $20 in his favor (say, $18 for himself and $2 for the other player), then the second player would reason that $2 was better than nothing and would accept the proposed division. As a result, economists believed that the vast majority of divisions in ultimatum bargaining games would be lopsided.

Experimenters who have supervised these games report two fascinating conclusions. First, the modal response is an even division of the stakes, and almost all of the subjects divide the surplus so as to give the first player no more than sixty percent of the surplus and the second player no less than forty percent.[19] Second, the vast majority of second players reject the proposed division and take nothing if the first player proposes a split that leaves the second player with less than thirty percent of the surplus.[20]

A very powerful social norm of fairness among the experimental subjects can plausibly explain these results. The norm is so powerful that it induces the first player to propose a relatively equal division of the stakes, even when he or she could have done much better and there is no opportunity for retaliation. Further, it induces the second player to take nothing when the proposed division lies outside the acceptable norm. If that norm guides most bargaining behavior when there is no face-to-face meeting, then it surely works at least as strongly in bargains where there is face-to-face contact or where there is an ongoing relationship between the bargainers. These results suggest an important legal implication: Law does not need to concern itself overly with the equitable division of cooperative sur-

19. See generally the literature cited in Rubin, *supra* note 17; *see also* Thomas S. Ulen, *Rational Choice and the Economic Analysis of Law*, 19 L. & SOC. INQUIRY 487 (1995).

20. *See* Korobkin & Ulen, *supra* note 18, at 334.

pluses (when transactions can occur) because social norms police that behavior.[21]

I do not want to be Pollyanna-ish about these matters. Surely, in some circumstances, social norms may fail to catch overreaching behavior. Law can correct for such circumstances, as with the unconscionability defense in contract law. But that qualification aside, social norms may serve to correct for some of the problems that a single-minded regard for efficiency might miss.[22] And yet my own discussion of the social norms literature is incomplete; I have not yet explicitly shown how social norms might serve as correctives for cognitive limitations.[23]

The ability of legislative action and ex ante administrative agency regulation to correct problems of cognitive limitations also deserve greater attention than the Articles in this Symposium have given them. The authors here have dwelt on crafting common law rules to take account of limited rationality among legal decision makers. But in some circumstances a statute or ex ante administrative regulation might furnish a better corrective.[24]

Several broad issues demand a fuller consideration of these alternative correctives for cognitive limitations. One might be called the "Olympian perch" problem: In some circumstances, legal decision makers are not subject to the same distortions of judgment that afflict those whom they seek to regulate. Such distortions might suggest that bench trials or rulemaking by administrative agencies determines liability better than jury trials.

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21. As a corollary, law could focus on encouraging efficient behavior, including the correction of cognitive limitations that lead to socially sub-optimal outcomes, and leave equitable considerations to social norms.

22. Ellickson gives one of the most intriguing studies of the relationship between social norms and law. *See* ORDER WITHOUT LAW, *supra* note 15; *Coase and Cattle*, *supra* note 15. Both his pieces there cited study the relationship between ranchers and farmers in Shasta County, California, with respect to the issue of straying cattle. He finds that law was irrelevant to the manner in which people in Shasta County dealt with that issue. People conformed their behavior to social norms, not to the law, and the prevailing norm was one of neighborliness. For instance, if cattle strayed onto someone's land, the expectation was that he would call the owner and feed and care for the cattle until the owner could come to retrieve them. People resorted to litigation only when norms broke down, because they perceived the resort to litigation as unneighborly.

23. In addition to norms, unconscious or guided emotional responses may seek to achieve the same social benefits as do norms and law. For instance, shame, honor, guilt, and a distrust for envy are all emotions that are difficult to counterfeit and whose ends are the limitation of socially destructive behavior.

24. For a consideration of the relative strengths of the market, common law rules and standards, and administrative agency regulation as correcting conditions of market failure, see NEIL K. KOMESAR, IMPERFECT ALTERNATIVES: CHOOSING INSTITUTIONS IN LAW, ECONOMICS AND PUBLIC POLICY (1994).

But public law solutions have their own problems. Even if cognitive limitations distort judgment of legal decision makers less than that of individual decision makers, public choice considerations may distort the decision making of legislators and administrators away from social optima.[25] These problems are so well known that they do not require review here. I bring them up solely because in making a reasoned assessment of whether common law rules, social norms, statutes, or administrative agency regulations best correct for a given cognitive limitation, we should take account of the public choice distortions that may attend the legislative and administrative processes.

IV. WHAT NEXT FOR BEHAVIORAL LAW AND ECONOMICS?

Behavioral law and economics should address three matters in the near future. First, the field needs much more nuance in its findings.[26] For instance, we need to know if in some circumstances cognitive limitations affect all actors, and if in others they only affect certain people. Can we distinguish people who rarely make cognitive errors so that, for example, they can waive their right to Social Security and assume complete responsibility for their own retirement, or waive the requirement that they purchase a car with a passive restraint device, on the theory that they truly understand the risks they run?

The current state of our learning seems to suggest that any shortcoming in cognitive abilities that we discover applies to everyone in similar circumstances. Take the ability of individuals to deal with risk. The behavioral literature is replete with examples of the difficulties that otherwise sensible individuals have in dealing with risk.[27] Indeed, these studies imply that risk presents insurmountable problems for everyone. Surely this implication goes too far. And even if we accept the literature's conclusion at face value, so that we presume everyone incapable of adequately dealing with risk, a plausible response is, "So what? Mind your own business. I'm free to make my own mistakes."

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25. *See generally* DANIEL A. FARBER & PHILIP P. FRICKEY, LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION (1991).

26. This is one of the central points in Samuel Issacharoff, *Can There Be a Behavioral Law and Economics?*, 51 VAND. L. REV. 1729, 1741-44 (1998).

27. *See, e.g.*, PLOUS, *supra* note 14, at 131-44.

This objection is no mere quibble. It has profound implications for legal issues like privatization of state-run retirement accounts. The literature on cognitive limitations offers some justification for government-mandated saving for retirement.[28] Evidence suggests that almost everyone has problems with intertemporal choice, in that they value immediate gratification far more than delayed gratification in a manner that suggests an inconsistent rate of time preference.[29] For example, all of us wish that we had the self-control not to eat foods that, although good-tasting, may have dire consequences for future health. Because similar problems present themselves with respect to current consumption versus saving for future consumption and because those who fail to save may become a burden on all the rest of us in their old age, we can make a fairly strong case for compelling individuals to save for their future.

These considerations do not really reach the issue of whether the mandatory retirement program should be publicly or privately provided. As a matter of public policy, retirement income ensures that people have a sufficient amount of money on which to live when they stop working, so they do not become wards of the state. That concern seems separable from the cognitive impairment issue of who should do the investing of each person's government-mandated savings. Of course, a private retirement fund entails important administrative details. For example, the government should guarantee the solvency of the private fund[30] and insure that the return on the private providers' portfolio suffices to generate an adequate retirement income. But these details are manageable and relatively uncontroversial. A recognition of cognitive limitations adds little to the issue of whether privatization of Social Security is a good idea—given that those limitations have already made out a case for compulsory retirement savings.[31]

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28. So do others. *See, e.g.*, RICHARD A. POSNER, AGING AND OLD AGE 262-64 (1996).

29. *See* ROBERT NOZICK, THE NATURE OF RATIONALITY 14-18 (1993); George Ainslie, *Beyond Microeconomics, in* THE MULTIPLE SELF 133 (Jon Elster ed., 1986); George Ainslie, *Specious Reward: A Behavioral Theory of Impulsiveness and Impulse Control,* 82 PSYCHOL. BULL. 463 (1975).

30. The federal government, through the Federal Deposit Insurance Corporation, provides insurance for some deposits in financial institutions. Similarly, the Employees Retirement and Income Security Act, Pub. L. No. 93-406, 88 Stat. 829 (1974) (codified as amended in scattered sections of 26 U.S.C. and at 29 U.S.C. §§ 1001-1461 (1994)), established the Pension Benefit Guaranty Corporation to protect retirees against losses because of underfunding or malfeasance in respect of a retirement account.

31. I leave out discussion of whether individuals should be allowed to waive mandatory retirement savings. Could someone warrant that she did not need retirement savings and that in exchange for not having te save, she would guarantee not te become a ward of the state? The practical impediments te such waiver are immense—such as, would society really be unwilling

A second issue requires attention in the near term: We must account for the fact that rational choice theory adequately explains and predicts market behavior, but less accurately explains and predicts non-market behavior. Three factors recommend the rational choice model as a better guide to market choices than to non-market choices. First, market choices are frequent and routine. Even if people make mistakes when they make their first market choices, they have an opportunity to learn through repeated transactions. Moreover, in those instances in which market transactions are rare in an individual's life—as in, for example, the purchase of a house—a first-time purchaser can learn from others who have made these rare transactions. Generally, however, the rarer a market choice is, the more difficulties it creates for individuals. In contrast, many non-market choices are so rare that people do not have repeated opportunities te learn and to make corrections. Even though one might consult others for help with these infrequent non-market choices, each individual's circumstances with respect to many of these choices are so highly particularized that the others' experiences may not be an appropriate guide to one's own best course of action. Consider, for example, love, marriage, and child-rearing.

Second, market choices are mediated through money, making commensurability much easier. We do not have problems of "comparing apples and oranges" in many market transactions because the choices almost always involve the purchaser's surrendering money. Because the purchaser knows or could learn the market price of other goods and services or can compute an opportunity cost, he can make a fairly accurate estimate of the comparative worth of very different courses of action, such as whether to buy a new car or to spend another year in school.[32] By contrast, non-market choices frequently do not involve a common measuring rod like money. Therefore, making comparisons across non-market alternatives or between a market and a non-market alternative may be very difficult. How does one compare the profound experience of parenthood with the cost of an exotic vacation?

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to help someone who executed the waiver but then showed up on society's doorstep penniless at age 70? More generally, should society allow some people to waive legal rules addressed at correcting cognitive limitations that many people have? If so, under what conditions would we allow someone to execute such a waiver?

32. One might argue that the presence of money allows only a comparison of the *pecuniary* aspects of market choice. It is precisely the non-pecuniary aspects, even of market choices, that give people difficulty.

Third, market choices are transparent, save when they are complex and reserved for specialists, as in some options valuations. There is frequently a single best (optimal) decision. But non-market choices are often difficult to understand and may have a variety of suitable outcomes. For example, only a specialist in the law can understand the difference in obligations under comparative versus contributory negligence regimes. Some people recognize their shortcomings and consult a specialist, especially when the stakes are high. But not everyone knows or will admit their inability to see through a problem, and they will not consult a specialist when faced with a complex non-market choice.

Taken together, these issues of frequency, commensurability, and transparency are at the heart of why rational choice theory does a far better job of explaining market choices than non-market choices.

I hope that behavioral law and economics will soon address a third issue—the distinction between ingrained cognitive limitations and those that are not hard-wired into us and are therefore subject to behavioral modification. The first kind of cognitive limitation is part of our evolutionary adaptation; the second results from application of unfamiliar skills. If natural selection has hard-wired our brains for a particular cognitive limitation (e.g., overoptimism or finding order where there is mere randomness), then we probably cannot fully escape those limitations. While we might will ourselves not to be overoptimistic, that desire likely cannot overcome our instinct. If the law recognizes that these limitations are adaptive and hard-wired, then it might take account of them. To consider a somewhat controversial example, Professor Owen Jones observes that stepparents are forty to one hundred times more likely to abuse their adopted children than are natural parents to abuse their children.[33] Moreover, when natural parents abuse their children, they far more often abuse their younger, smaller, and less healthy offspring.[34] Professor Jones attributes these data to forces of evolutionary adaptation that select for human minds that respond to children in particular ways.

The legal implications of these hard-wired forces may be profound. Law and economics might deter stepparent child abuse by prescribing more severe, swifter, or more certain sanctions for stepparents who abuse their children than for natural parents who abuse

33. *See* Owen D. Jones, *Law and Biology: Toward an Integrated Model of Human Behavior*, 8 J. CONTEMP. LEGAL ISSUES 167 (1997). For a discussion of broader issues, see generally E. Donald Elliott, *Law and Biology: The New Synthesis?*, 41 ST. LOUIS U. L.J. 595 (1997).

34. *See* Jones, *supra* note 33, at 181.

their children. To the extent that individuals cannot control this abusive behavior, different correctives may be necessary. One might recommend special counseling for stepparents to alert them to these behaviors and for natural parents to warn them of the special dangers of abuse faced by their younger, smaller, and less healthy children. Whatever else law might do to address hard-wired behavioral problems, those legal solutions almost certainly must be mandatory rules, not waivable rules or vague standards.

Evolutionary adaptation does not always produce thorny problems for communal, neighborly living. It sometimes solves social problems by favoring cooperative solutious to selfish ones.[35] As noted above, we seem to be disposed to cooperate with others in many social settings, as in the division of a cooperative surplns.[36] If this disposition holds true, then law need not agonize over redistributive issues.[37]

Other cognitive limitatious are attributable principally to a lack of learnable skills. Many puzzles applying probability calculus fall into this category.[38] Consider an example—the famous base rate fallacy. Suppose that a deadly disease afflicts one in 10,000 people and that a test detects the disease with ninety-nine percent accuracy. If you test positive, what is the probability that you actually have the disease? Most people, unskilled in probabilistic calculations, answer, "ninety-nine percent." But that answer is wildly inaccurate.

Suppose that 10,000 people take the test. Of those 10,000, only one actually has the disease. Presumably, this person will test positive.[39] Of the 9,999 who do not have the disease but took the test, one percent will falsely test positive. That is, ninety-nine people will test positive for the disease, even though they do not have it.[40] A total

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35. For more on this theme, see THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE (John Barkow et al. eds., 1992); ROBERT AXELROD, THE COMPLEXITY OF COOPERATION: AGENT-BASED MODELS OF COMPETITION AND COLLABORATION (1997); ROBERT AXELROD, THE EVOLUTION OF COOPERATION (1984); FRANS DE WAAL, GOOD NATURED (1996); MATT RIDLEY, THE ORIGINS OF VIRTUE: HUMAN INSTINCTS AND THE EVOLUTION OF COOPERATION (1997); MATT RIDLEY, THE RED QUEEN: SEX AND THE EVOLUTION OF HUMAN NATURE (1993).

36. *See* Elizabeth Hoffman et al., *Behavioral Foundations of Reciprocity: Experimental Economics and Evolutionary Psychology*, 36 ECON. INQUIRY 335 (showing the two results mentioned and contending that experiments with undergraduate subjects show that human beings are adaptively programmed to cooperate with others, even in single-play games, and to identify and punish cheaters).

37. *See* Korobkin & Ulen, *supra* note 18, at 342-43.

38. *See* PLOUS, *supra* note 14, at 115-16; Daniel Kahneman & Amos Tversky, *On the Psychology of Prediction*, 80 PSYCHOL. REV. 237 (1973).

39. Testing positive is not certain to happen hecause the test is not infallible. It could give a false negative.

40. Rounding down, for convenience; the actual figure is 0.01 x 9,999 = 99.99.

of 100 people test positive for the disease, but only one is actually infected. Therefore, the probability that you actually have the disease, given that you tested positive, is one percent.[41]

These pitfalls in applying unfamiliar cognitive skills may also have profound legal implications, but they probably differ significantly from the correctives for hard-wired limitations. We can educate decision makers about the base rate fallacy so that they can better deal with situations calling for Bayesian inference. For instance, Professors Finkelstein and Fairley call for explicit instruction in Bayesian inference for jurors who must evaluate identification evidence.[42] Others suggest that instead of requiring everyone to become comfortable with probability calculus, we should encourage society to convey Bayesian information to decision makers in easily understandable ways. As an example, a physician might convey the information discussed above to someone whose test was positive in this way:

> [I]n recent years the prevalence of HIV in German men who do not belong to a risk group is 0.01 percent, the sensitivity (hit rate) of a typical HIV test is 99.99 percent, and the false positive rate is perhaps 0.01 percent. The prospects of a patient who has tested positive do not sound very good. But now imagine that a doctor counseled a patient as follows: "Think of 10,000 heterosexual men like you. We expect one to be infected with the virus, and he will almost certainly test positive. Of the 9,999 men who are not infected, one additional man will test positive. Thus we get two who test positive, but only one of them actually has the virus. All we know at this point is that you have tested positive. So the chance that you actually have the virus is about 50-50."[43]

Couching probabilities in the form of frequencies in this fashion vastly improves the accuracy of people, including specialists, at estimating the probabilities.

Undoubtedly, many gradations of cognitive limitation separate the hard-wired and learnable categories I have identified. And many possible legal correctives remain to be marshalled, such as shifting burdens of proof, favoring rules over standards, altering liability rules, replacing common law rules or standards with administrative

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41. I leave as an exercise for the reader the computation of the conditional probability of actually having the disease if a second test, administered only to those who testod positive the first time, is positive. One should always get a second opinion. A third opinion is a clincher, as you should be able to show.

42. *See* Michael O. Finkelstein & William B. Fairley, *A Bayesian Approach to Identification Evidence*, 83 HARV. L. REV. 489 (1970). Professor Tribe criticized this view in Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329 (1971).

48. STEVEN PINKER, HOW THE MIND WORKS 348 (1998).

rules or statutes, and so on. One of the most productive things that behavioral law and economics can do in the next decade is to categorize and place cognitive limitations on the hard-wired/learnable spectrum and match legal and other correctives to these categories. Ultimately, we shall produce a crisp and clear set of cognitive failures with their correctives that commands the same consensus as the current set of market failures and correctives.

V. CONCLUSION

Behavioral law and economics is exciting, and it is only beginning. A new theory of human decision making is in the offing, one that captures the best of rational choice theory and supplements it with a subtle view of how and why and when humans make mistakes in judgment. In light of this promise of a more comprehensive theory, only "a mind debauched by learning"[44] could stubbornly cling to a version of rational choice theory in which errors arise only from conditions of market failure and not from predictable fallibilities of the human mind.

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44. WILLIAM JAMES, PSYCHOLOGY: BRIEFER COURSE 394 (1892). The full quote is this:

> It takes . . . a mind debauched by learning to carry the process of making the natural seem strange, so far as to ask for the *why* of any instinctive human act. To the metaphysician alone can such questions occur as: Why do we smile, when pleased, and not scowl? Why are we unable to talk to a crowd as we talk to a single friend? Why does a single maiden turn our wits so upside-down? The common man can only say, "*Of course*, we smile, *of course* our heart palpitates at the sight of the crowd, *of course* we love the maiden, that beautiful soul clad in that perfect form, so palpably and flagrantly made for all eternity to be loved.

Id.