Rational Choice, Behavioral Economics, and the Law

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INTRODUCTION

Jolls, Sunstein, and Thaler wish to use the insights of behavioral economics to improve economic analysis of law, which they believe to be handicapped by its commitment to the assumption that people are rational.[1] The editors of the *Review* have asked me to comment on JST's paper, no doubt because of my identification with rational-choice economics. Since JST complain with some justice that economists and economically minded lawyers do not always make clear what they mean by "rationality," let me make clear at the outset what I mean by the word: choosing the best means to the chooser's ends. For example, a rational person who wants to keep warm will compare the alternative means known to him of keeping warm in terms of cost, comfort, and other dimensions of utility and disutility, and will choose from this array the means that achieves warmth with the greatest margin of benefit over cost, broadly defined. Rational choice need not be conscious choice. Rats are at least as rational as human beings when rationality is defined as achieving one's ends (survival and reproduction, in the case of rats) at least cost.

No doubt my definition lacks precision and rigor. But it is good enough to indicate the difference in approach between rational-choice economics and behavioral economics.

I don't doubt that there is something to behavioral economics, and that law can benefit from its insights.[2] The phenomena that JST discuss and

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1. → Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471 (1998) [hereinafter "JST"].

2. For an illustrative recent study that JST do not cite, see Larry T. Garvin, *Adequate Assurance of Performance: Of Risk, Duress, and Cognition*, 69 U. COLO. L. REV. 71, 140–174 (1998). For a useful survey of behavioral economics, differing from JST's in not highlighting legal applications, → Matthew Rabin, *Psychology and Economics*, 36 J. ECON. LITERATURE 11 (1998).

document under the rubric of behavioral economics are real, and some of them challenge at least the simplest rational-choice models. The paper itself is lucid, plausible, impressive in its range of references, and in many places ingenious. A useful synthesis and extension of the existing literature, it is the first paper to try to relate behavioral economics as a whole to economic analysis of law as a whole. The many strengths of the paper are, however, self-evident, so I shall concentrate on what seem to me to be its weaknesses.

JST overargue their case. This is primarily because of a failure to specify clearly the domains of either behavioral economics or what JST call "conventional" economic analysis of law. Some of the insights they ascribe to behavioral economics are already a part of economic analysis of law, which long ago abandoned the model of hyperrational, emotionless, unsocial, supremely egoistic, nonstrategic man (or woman[3]) that JST in places appear to ascribe to it.[4] Other points they make are new labels for old challenges to the economic model of behavior that owe nothing to behavioral economics in any distinctive sense. Others are best explained by reference to evolutionary considerations that play no role in behavioral economics, at least as conceived by JST.[5] Others are only weakly supported. And despite the length of the paper, the range of legal doctrines, institutions, and procedures discussed in it is meager in comparison to the rich canvass of prebehavioral economic analysis of law. The paper is critical of the efforts of economists to enrich the model of rational choice, efforts that the paper describes as ad hoc, yet its own approach is ad hoc; and though it prides itself on empirical rigor and predictive accuracy, it is deficient in both qualities. These are remediable deficiencies, however, and I expect that they will be remedied in future work by these and other scholars.

JST don't actually tell us what "behavioral economics" means. But implicitly they define it negatively: It is economics minus the assumption that people are rational maximizers of their satisfactions. Its relation to standard economics is thus a bit like the relation of non-Euclidean to Euclidean geometry, though with the important difference that non-Euclidean geometry is as theoretically rigorous as Euclidean geometry, whereas behavioral economics is, as we shall see, antitheoretical.

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3. The term "rational man" is not intended to connote gender. Economic analysis of law, like economic analysis generally, assumes that women are rational to the same degree as men.

4. It is noteworthy that Professor Coase, whom JST properly regard as a principal founder of "conventional" law and economics (of which the Coase theorem is indeed a cornerstone), rejects the traditional economic model of man as a rational maximizer of his satisfactions. *See* RONALD H. COASE, THE FIRM, THE MARKET, AND THE LAW: ESSAYS ON THE INSTITUTIONAL STRUCTURE OF PRODUCTION 4 (1988); Ronald H. Coase, *The New Institutional Economics*, 140 J. INSTITUTIONAL & THEORETICAL ECON. 229, 231 (1984).

5. This qualification is implicit in all I say in this comment about behavioral economics. I am not familiar with the full range of the behavioral economics literature.

I. THE THREE "BOUNDEDS" AND THE INTERFACE BETWEEN ECONOMICS AND PSYCHOLOGY

A. *Bounded Rationality*

Behavioral economics rejects the assumption that people are rational maximizers of preference satisfaction in favor of assumptions of "bounded rationality," "bounded willpower," and "bounded self-interest." The first, and most familiar, of these terms refers to the fact that people have cognitive quirks that prevent them from processing information rationally. This phenomenon is distinct from positive information costs. The latter phenomenon conventional rational-choice theory has no difficulty assimilating. Rationality does not imply omniscience. Indeed, it would be profoundly irrational to spend all one's time in the acquisition of information.

The cognitive quirks that set bounds on rational maximizing include the availability heuristic, overoptimism, the sunk-cost fallacy, loss aversion, and framing effects, all clearly explained by JST. The evidence for the existence of these quirks (and more broadly, if less interestingly, for the fact that there is plenty of bad thinking) is considerable, and an especially persuasive part of their paper shows that the quirks must be taken into account in the design of an effective program of public information, although I do think JST make one mistake in their discussion of information strategies. They recommend, as an effective method of deterring unlawful behavior, making law enforcement "highly visible," as by replacing conventional parking tickets with "large, brightly-colored tickets that read 'VIOLATION' in large letters on the driver's side window."[6] This is actually a risky deterrent strategy. Suppose that the police ticket only one in every hundred violators. The low probability of being ticketed will be highlighted by the increased visibility of the tickets. Ask yourself: Would deterrence be increased or decreased if law enforcement authorities informed the public of the actual probability that a given offense would result in arrest, prosecution, and conviction?

A much larger problem is JST's failure to distinguish between impediments to clear instrumental reasoning and preferences that we enlightened observers may think silly. Take the case of a person who will eat a lobster contentedly if he doesn't see it when it's alive, but if he's asked to pick it out of a lobster tank will lose his appetite for it. JST would say that this person's mind had been fogged by the availability heuristic. But an alternative interpretation is that this person simply has different preferences for two different goods: One is a lobster seen only after being cooked, and the other is a lobster seen before, in his living state, as well as after. These are different goods in the same way that a good that comes in pretty wrapping paper is

6. JST, *supra* note 1, at 1538.

different from a good that comes in a brown paper bag. There is no basis for pronouncing a difference in preferences with regard to such pairs of goods irrational (although ethical criticism may be possible, as animal-rights advocates remind us)—or for dismissing the difference as a product of "emotion." When people react with fright to a horror film, we might be tempted to say that they are being irrational, because the movie is make-believe. But preferences cannot be divorced from emotion, or emotion from their stimuli, and so instrumental reasoning cannot be thought pervaded with irrationality merely because a frequent goal of such reasoning is a preference that we would not have if we were not emotional beings. The way to distinguish a real cognitive quirk from an emotion-driven preference is to ask whether if you point out to a person the "irrationality" of his action he either will change it or at least will admit that he is being irrational. Obviously it would do nothing to the preference for horror movies to point out that they are make believe; the people who watch them know that already.

Moreover, the fact that people are not always rational, even that some are irrational most or all of the time, is not in itself a challenge to rational-choice economics. Many people have an irrational fear of flying. It is an irrational fear, I concede, rather than just an aversion that we may not share, because the people who harbor it believe it is irrational. They know that the surface-transportation alternatives are more dangerous, and they want above all to avoid being killed; yet they choose the more dangerous mode anyway. Their regret, embarrassment, and annoyance with themselves distinguish their case from that of the people who like horror movies. But their irrationality does not invalidate the economic analysis of transportation, although it may show why pecuniary and time costs, and accident rates, may not explain the entire difference between the demand for air transportation and the demand for its substitutes. A preference can be taken as a given, and economic analysis proceed as usual, even if the preference is irrational.

Voting, one of JST's own examples of irrational behavior, can be analyzed similarly. Voting is irrational (at least when viewed as an instrumental act) because it costs something (chiefly time) to vote, yet there is no offsetting benefit to the individual voter because virtually no elections are decided by one vote. But treating the desire to vote as a given, the economist can answer important questions about voting behavior. These questions include why the old vote more than the young, why retired people vote more than unemployed people (even though both groups might seem to have low costs of time), and why turnout is greater in a close election.[7] It is not because one's vote is more likely to make a difference—even close elections are not decided by one vote—but because the costs of information are lower the

7. *See* RICHARD A. POSNER, AGING AND OLD AGE 148–152 (1995).

more publicity an electoral contest generates, and close elections generate more publicity than one-sided ones.

B. *Bounded Willpower*

This term is a relabeling of weakness of will. (JST may have attached the word "bounded" to each of their three categories in order to create the appearance that their paper is indeed proposing a *unified* framework of analysis.) Most of us have experienced the sensation of being torn between two selves—a "good" self that has our long-run welfare in mind and a "bad," short-sighted self—and of the "bad" self winning unless strenuous efforts are made to thwart him. Hyperbolic discounting is said to illustrate the operation of weakness of will, although it can equally well be understood in terms of information costs. A hyperbolic discounter increases his discount rate as the costs or benefits that he is discounting become more imminent. For example, if you asked me whether I would rather have $1,000 in the year 2010 or $800 in the year 2009, I would almost certainly say $1,000 in 2010. But if you asked me whether I would rather have $800 today or $1,000 a year from now, I might very well say $800 now. And this would mark me as a hyperbolic discounter. But the reason for the different reactions may simply be that I lack a clear conception of my consumption needs a decade and more hence. I cannot imagine what might make me pay in effect a huge interest rate to reallocate consumption from 2010 to 2009. The fact that knowledge and imagination are "bounded" just shows, what no rational-choice economist doubts, that information costs are positive.

I do not doubt that there is such a thing as weakness of will, even if hyperbolic discounting is not a good example of it. But unlike the cognitive quirks ("bounded rationality"), it can be analyzed within the framework of rational-choice theory.[8] This is true even of those cases that cannot be referred to the difficulty of the choice facing the individual. We can be torn between alternative courses of action because of uncertainty. That poses no puzzle at all for rational-choice theory. What does pose a puzzle is refusing to keep chocolate in the house because of fear of not being able to overcome temptation. Explaining such behavior in rational-choice terms may nevertheless be possible, but it may require abandoning a tacit assumption of most economic analysis—that the self is a unity—in favor of a conception of the person as a locus of different selves. All the selves are rational but they have inconsistent preferences. Examples are a young self versus an old self, with the former unwilling to save money so that the latter can enjoy a high level of consumption; a pre-accident self unwilling to spend heavily on accident insurance versus a post-accident self that would have liked the pre-accident

8. As acknowledged by Rabin, *supra* note 2, at 39-40.

self to buy a lot of accident insurance; and in the case of the chocolate, a present-oriented self that lives for the moment and a future-oriented self.[9] (The last example is related to the first.) The assumption of a unitary self is not inherent in the concept of rationality used in economics; it is merely a convenient assumption in most situations that economists analyze. JST do not discuss the "multiple selves" approach.

This is an example of JST's tendency to give up on rational-choice economics too soon.[10] Another is their remark that because random choice in a situation of scarcity will generate a downward-sloping demand curve, "downward-sloping demand is not evidence in support of optimizing models."[11] Wrong. Buyers do not choose randomly. Rationality is the only reasonable explanation for their reactions to changes in relative prices. The real significance of randomness for rational-choice economics is in further explaining why that economics can accommodate a good deal of irrational behavior without losing predictive force. Most questions economists ask concern aggregate rather than individual behavior, for example the effect on the quantity purchased of cigarettes of an increase in the cigarette excise tax, not the effect of the tax increase on Mr. Cigarette Smoker A or Ms. Cigarette Smoker B. Suppose the tax increase is two percent and rational smokers respond by reducing their purchases of cigarettes by an average of one percent while the irrational ones respond randomly—some reduce their purchases by fifty percent, some actually increase their purchases, and so on. If the distribution of these random behaviors has the same mean as the rational smokers' reaction to the tax, the effect of the tax on the quantity demanded of cigarettes will be identical to what it would be if all cigarette consumers were

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9. *See, e.g.*, Thomas C. Schelling, *Self-Command in Practice, in Policy, and in a Theory of Rational Choice*, 96 AM. ECON. REV., May 1984, Papers & Proceedings, at 1; Richard A. Posner, *Are We One Self or Multiple Selves? Implications for Law and Public Policy*, 3 LEGAL THEORY 23 (1997).

10. This tendency is common among behavioral economists. Here is an example from Rabin: "A nominal wage increase of 5 percent in a period of 12 percent inflation offends people's sense of fairness less than a 7 percent decrease in a time of no inflation." Rabin, *supra* note 2, at 36. People know that not all wages will increase by the rate of inflation—inflation spells economic trouble, and only with perfect indexing would real wages remain unaffected by it. So the failure of one's wage to rise by the rate of inflation need not imply a criticism of one's work. But a sharp wage cut out of the blue is frequently a signal of dissatisfaction with an employee's work, and so engenders anxiety or resentment. The different reactions in the two situations are, thus, quite rational and easily explained.

11. JST, *supra* note 1, at 1482. The reference is to Gary S. Becker, *Irrational Behavior and Economic Theory*, 70 J. POL. ECON. 1, 4-9 (1962), *reprinted in* GARY S. BECKER, THE ECONOMIC APPROACH TO HUMAN BEHAVIOR 153, 156-63 (1976). Becker's argument is that consumers have limited budgets, and so on average they will purchase less of a pricier good because a fixed amount of money will not buy as much of it. *See id.* at 5, *reprinted in* GARY S. BECKER, THE ECONOMIC APPROACH TO HUMAN BEHAVIOR 153, 158 (1976). Becker did not suggest, however, that most consumers are irrational, or that well-attested economic phenomena other than the downward-sloping market demand curve, such as the tendency of the prices of the same good to be equalized, could be explained without assuming rationality.

rational. And this is true no matter what fraction of cigarette consumers is irrational.

We are beginning to see that rational-choice economics is more robust than JST believe, and here is another example. They claim that economic analysts of self-destructive behavior, such as drug addiction and unsafe sex, use rationality "to mean simply that people 'choose' what they 'prefer,'"[12] and that this shows that rational-choice economics cannot deal with such behavior. Not so. The economic analysts to whom JST are referring assume that people do not want to become addicted or to contract AIDS. Their analysis explores the conditions under which the costs of such behavior, steep as they are, are nevertheless outweighed by perceived benefits. They deduce from rational-choice theory, and then test empirically, nonintuitive hypotheses about these unconventional behaviors. An example of such a hypothesis is that the long-run price elasticity of addictive goods is high, rather than low as conventionally believed, because the rational addict expects his consumption of the addictive good to increase over time, and therefore a price increase has a big long-term effect on his expenses.[13] Another example is the hypothesis that the AIDS epidemic will increase the rate of unwanted pregnancies by inducing a rational substitution of condoms (which are good prophylactics against disease but mediocre contraceptives) for the pill (which is an excellent contraceptive, but no prophylactic).[14]

Addiction, whether to crack cocaine or to unsafe sex, is weakness of will writ large; yet economists can model it in rational-choice terms. This shows that the mere existence of the irrationalities emphasized in behavioral economics need not derail rational-choice economics.

C. *Bounded Self-Interest*

By this JST mean that people sometimes act out of motives (compendiously, for JST, "fairness") that do not seem explicable by self-interest even in the sense, which is now conventional in rational-choice economics, in which an altruistic act can be deemed self-interested. All that is required to understand altruism as a form of rational self-interest is the assumption of interdependent utilities. If your welfare enters positively into my utility function, then I can increase my own welfare by increasing your welfare; and if it enters negatively, then I can increase my welfare by reducing yours. JST are not interested in altruism, positive or negative, in the sense of interde-

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12. JST, *supra* note 1, at 1488.

13. *See* Gary S. Becker, Michael Grossman & Kevin M. Murphy, *Rational Addiction and the Effect of Price on Consumption*, 103 AM. ECON. REV., May 1991, Papers & Proceedings, at 237, *reprinted in* GARY S. BECKER, ACCOUNTING FOR TASTES 77 (1986).

14. *See* Tomas J. Philipson & Richard A. Posner, *Sexual Behaviour, Disease, and Fertility Risk*, 1 RISK DECISION & POL'Y 91 (1996).

pendent utilities; that belongs to the domain of rational-choice economics. They are interested in cases in which a person will do something for other people—or against other people—because he thinks it the fair thing to do.

The lumping in of this phenomenon with cognitive quirks and weakness of will is evidence for my point that behavioral economics is the negative of rational-choice economics—the residuum of social phenomena unexplained by it. JST do not try to connect their claim that "fairness," which, as I have just noted, they define in golden-rule terms (be kind to the kind, and unkind to the unkind), is important to some people some of the time with their claims that people have difficulty processing some types of information and subordinating short-run to long-run interests. These are disabilities or insufficiencies; acting in accordance with notions of fairness is a strength. JST don't establish a logical or other relation among the three assumptions that define behavioral economics. The cognitive quirks belong to cognitive psychology, weakness of will to the psychology of neurosis and other abnormalities, and fairness to moral psychology.

JST's project would be clearer though still not theoretically coherent if they had entitled their paper, "A Psychological Critique of Economic Analysis of Law." For they do not have an economic theory to set against rational-choice theory. I have suggested that rational-choice theory might have something to say about weakness of will, and we are about to see that it may have something to say about fairness in the golden-rule sense and about one of the cognitive quirks as well (the sunk-costs fallacy). About both weakness of will and the cognitive quirks the obvious question for the economist is how competition in financial and other markets either fails or succeeds in "treating" these defects in our perceptions, understandings, and actions; the analogy would be to health economics. A psychological study of markets could be called an economic study; economics can be defined by its subject as well as by its approach. But like standard economic analysis of law, JST's domain is far broader than markets. If there is any theory in their approach, it is not an economic theory. They take a psychological approach to phenomena that are sociological and psychological as much as they are economic, yet call their approach economic. It is as if they thought economics the only social science, which if true would mean that any social scientific critique of economics must itself be a part of economics. That is a considerable complement to economics. But the paper would be easier to understand if it were offered to the reader as a contribution to the psychological analysis of law rather than to the economic analysis of law.

II. THE QUESTION OF THEORY

The picture that JST paint with the three "boundeds" is of a person who has trouble thinking straight or taking care for the future but who at the same

time is actuated by a concern with being fair to other people, including complete strangers. This may be a psychologically realistic picture of the average person,[15] and it responds to the familiar complaint that "economic man" is unrecognizable in real life. But in theory-making, descriptive accuracy is purchased at a price, the price being loss of predictive power. The rational-choice economist asks what "rational man" would do in a given situation,[16] and usually the answer is pretty clear and it can be compared with actual behavior to see whether the prediction is confirmed. Sometimes it is not confirmed—and so we have behavioral economics. But it is profoundly unclear what "behavioral man" would do in any given situation. He is a compound of rational and nonrational capacities and impulses. He might do anything. JST have neither a causal account of behavioral man nor a model of his decisional structure.

The nebulousness of their ruling concept gives rise to all sorts of questions. Do cognitive quirks diminish as the costs of yielding to them rise? If so, why? Does weakness of will vary across people, and, again, if so why? Do JST believe that their own analysis is marred by cognitive quirks or weakness of will, or actuated by a sense of fairness, or of resentment at being treated unfairly?[17] If not, why not? And are the quirks curable? Is weakness of will curable? (Not, can these problems be circumvented, as in my chocolate example, but can they be solved, so that people are no longer afflicted by cognitive deformities and lack of willpower.[18]) Why do JST seem optimistic that a body of experts charged with regulating risks to safety and health might be free from cognitive quirks and weakness of will, and that these experts' concept of fairness might line up with the public interest? Why do JST treat politicians as simple maximizers of the probability of being reelected?

These questions are made both urgent and mysterious by the undertheorization of behavioral economics. It is undertheorized because of its residual, and in consequence purely empirical, character. Behavioral economics is defined by its subject rather than by its method and its subject is merely the

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15. It is the implicit modern *liberal* conception of the average person—good, but inept, and for both reasons not very responsive to incentives, though perhaps rather plastic. The implicit conservative view of the average person, in contrast, is that he is competent but bad; hence conservatives emphasize incentives and constraints.

16. He need only be rational with respect to the particular choice confronting him. People who are morbidly afraid of flying are assumed to respond rationally to changes in ticket prices, even though it is difficult to give a rational account of their fears.

17. Rabin claims that economists are subject to "same-evidence polarization," one of the cognitive quirks. *See* Rabin, *supra* note 2, at 27 n.21. Well, Rabin is an economist, as are Jolls and Thaler. Indeed, I give an example later of where JST appear to have succumbed to the hindsight fallacy, which is one of the cognitive quirks. *See* note 40 *infra*.

18. JST seem curiously fatalistic about the quirks and the weakness. (This may be because they have no theory of where these things come from.) I return to this point at the end of my comment. *See* Part VII *infra*.

set of phenomena that rational-choice models (or at least the simplest of them) do not explain. It would not be surprising if many of these phenomena turned out to be unrelated to each other, just as the set of things that are not edible by man include stones, toadstools, thunderclaps, and the Pythagorean theorem. Describing, specifying, and classifying the empirical failures of a theory is a valid and important scholarly activity. But it is not an alternative theory.

JST may have overlooked the distinction between a description and a theory because they confuse explanation and prediction. It's easy to formulate a theory that will explain, in the sense of subsume, all observations within its domain, however anomalous they are from another theoretical standpoint. The trick is to relax whatever assumptions in the other theory made some of the observations anomalous. The rotation of the moons of Jupiter was anomalous in medieval cosmology because each planet (other than the earth, which was not considered a planet, but instead the center around which the planets revolved) was thought to be fastened to a crystalline sphere, which the moons would have collided with in their rotation. The anomaly could be dispelled by assuming that the sphere was permeable, or by assuming (as Cardinal Bellarmine did in his famous dispute with Galileo) that the telescopic observations that had disclosed the rotation of Jupiter's moons were a deceit by the devil. Whichever route was taken, the amended theory would not generate any predictions about planetary satellites; all it would predict was that whatever would be, would be. Similarly, if rational-choice theory bumps up against some example of irrational behavior, the example can be accommodated by changing the theory to allow for irrational behavior. But there is no greater gain in predictive power than in the cosmology example; in both cases, in fact, there is a loss.

Karl Popper, whose philosophy has been highly influential in economics,[19] claimed that falsifiability was an essential feature of any useful scientific theory. If a theory cannot be falsified, neither it nor its predictions can be validated, for everything that happens is by definition consistent with the theory. JST's theory seems perilously close to the abyss of nonfalsifiability; perhaps it has fallen in. When people act rationally, JST do not treat this as contradicting the assumption of bounded willpower. When people resist temptations, thus demonstrating strength of will, this is not treated as contradicting the assumption of bounded willpower. And when they act selfishly, this is not deemed a contradiction of the assumption of bounded self-interest. If people became more rational, this would be attributed to their having learned the lessons of behavioral economics, and so would operate to confirm rather than refute it. So the question arises, what if any observation would falsify JST's theory? If none, they have no theory, but merely a set of

19. *See* RICHARD A. POSNER, THE PROBLEMS OF JURISPRUDENCE 363 & n.8 (1990).

challenges to the theory-builders, who in the relevant instances are rational-choice economists and, I am about to suggest, evolutionary biologists.

III. THE EVOLUTIONARY BIOLOGY OF FAIRNESS

"Fairness" is the vaguest word in the English language but the clearest example of JST's lack of theoretical ambition. Much of what they discuss under its rubric, including the ultimatum game, can be made precise, and explained, and subsumed under a broad conception of rationality, with the aid of the evolutionary biology of positive and negative altruism.

Evolutionary biology sees altruism as a trait that promotes inclusive fitness, defined as maximizing the number of copies of one's genes by maximizing the number of creatures carrying them, weighted by the closeness of the relation.[20] The inclusive fitness of a social animal like man is greatly enhanced by his having a proclivity to help his relatives, and so it is plausible to suppose that this proclivity evolved as an adaptive mechanism.[21] In the prehistoric epoch in which our instinctual preferences were formed, people lived in tiny, isolated bands. Most members of one's community would have been either one's relatives, or nonrelatives having very close affective ties to one (such as one's mate and his or her family), or at least having very frequent—indeed virtually continuous—face-to-face dealings with one. In these circumstances it would not have been essential to have an innate capacity to discriminate between relatives and other intimates, on the one hand, and, on the other hand, those people—call them "strangers"—with whom one did not have repeated face-to-face interactions.[22]

Nowadays we interact a great deal with strangers. But our instincts are easily fooled when confronted with conditions to which human beings never had a chance to adapt biologically. That is why a pornographic photograph can arouse a person sexually or a violent movie frighten an audience; why

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20. So, other things being equal, having three nephews (each a twenty-five percent genetic copy of you) will contribute more to your inclusive fitness than having one child (a fifty percent genetic copy of you). The qualification, "other things being equal," is vital. If your three nephews were much less likely to survive to reproductive age than the one child, they would contribute less, at least on an expected basis, to your inclusive fitness than the child.

21. *See, e.g.*, Susan M. Essock-Vitale & Michael T. McGuire, *Predictions Derived from the Theories of Kin Selection and Reciprocation Assessed by Anthropological Data*, 1 ETHOLOGY & SOCIOBIOLOGY 233 (1980) (noting several studies which indicate that people give more unreciprocated help to relatives than to non-relatives).

22. *Cf.* Charles J. Morgan, *Natural Selection for Altruism in Structured Populations*, 6 ETHOLOGY & SOCIOBIOLOGY 211 (1985) (modeling the evolution of altruistic behavior by assuming that altruists only help members of their respective "clans"); Charles J. Morgan, *Eskimo Hunting Groups, Social Kinship, and the Possibility of Kin Selection in Humans*, 1 ETHOLOGY & SOCIOBIOLOGY 83 (1979) (demonstrating a large correlation between social groupings and genetic relatedness). This analysis is questioned, however, in ALLAN GIBBARD, WISE CHOICES, APT FEELINGS: A THEORY OF NORMATIVE JUDGMENT 258 n.2 (1990).

people can love an adopted infant as much as they would their own biological child; why people are more frightened of spiders than of cars and of airplanes than of far more dangerous terrestrial forms of transportation; and why men do not clamor to be allowed to donate to sperm banks. Voting, giving to charities, and refraining from littering, in circumstances in which there is neither visible reward for these cooperative behaviors nor visible sanctions for defection, may illustrate an instinctual, and as it were biologically mistaken, generalization of cooperation from small-group interactions, in which altruism is rewarded (hence reciprocal) and failures to reciprocate punished, to large-group interactions in which the prospects of reward and punishment are so slight that cooperation ceases to be rational.[23]

Negative altruism is illustrated by the indignation that we feel when someone infringes our rights. The extreme expression of this emotion is the passion for revenge. This may seem the antithesis of rational thinking, because it flouts the economist's commandment to ignore sunk costs, to let bygones be bygones. Not that it is irrational to threaten retaliation in order to deter aggression; but if the threat fails to deter, carrying out the threat will often be irrational. No matter how much harm you do to the aggressor in return for what he has done to you, the harm that you have suffered will not be annulled. Whatever dangers or other burdens you assume in order to retaliate will merely increase the cost to you of the initial aggression. But if retaliation is futile for rational man, this will make the aggressor all the more likely to attack not the average man but—rational man. For the aggressor knows that rational man will treat bygones as bygones (or as economists say, ignore sunk costs) and will therefore be less likely to retaliate than a less rational person. This calculation will lower the anticipated costs of committing aggression.

What was needed for deterrence and hence survival in the state of human society before there were any formal legal or political institutions, and thus before it was possible to make a legally enforceable commitment to retaliate against an aggressor, was an instinctual commitment to retaliate. People who were endowed with an instinct to retaliate would have tended to be more successful in the struggle for survival than others. Sometimes retaliation ends in disaster; but inability to make a credible threat to retaliate renders a person virtually defenseless in a prelegal, prepolitical society. The desire to take revenge for real or imagined injuries—without calculating the net benefits of revenge at the time it is taken, because such calculation would, as I have suggested, reduce the credibility of the threat to retaliate and so would

23. *See* Cristina Bicchieri, *Learning to Cooperate*, *in* THE DYNAMICS OF NORMS 17, 39 (Cristina Bicchieri, Richard Jeffrey & Brian Skyrms eds., 1997); ODED STARK, ALTRUISM AND BEYOND: AN ECONOMIC ANALYSIS OF TRANSFERS AND EXCHANGES WITHIN FAMILIES AND GROUPS 132 (1995). Generalization (less grandly, pattern recognition) seems an innate, and very valuable, but of course fallible, capacity of the human animal.

invite aggression that would in turn reduce a person's inclusive fitness—may therefore have become a part of the human genetic makeup.[24] Here may be the biological origin of the sunk-costs fallacy, as well as the explanation for the sometimes crazy acts of violence that are common in human societies even today.

I have contrasted rational man with vengeful man, but it should be apparent that the contrast is superficial, that the real contrast is between ex post and ex ante rationality. Having an unshakable commitment to retaliate may be ex ante rational by lowering the risk of being a victim of aggression, even though, if the risk materializes, acting on the commitment will then (that is, ex post) become irrational. Put differently, a certain emotionality may be a component of rationality, which I defined at the outset as suiting means to ends rather than as a particular form of ratiocination.

We can see in this example how bringing evolutionary biology into the picture—an alternative strategy to that pursued by JST—enables the concept of rationality to be enlarged to cover phenomena (not only fairness but at least one of the cognitive quirks, the sunk-costs fallacy) that JST classify as irrational. They may object that my discussion of altruism and revenge is a spur-of-the-moment effort to save the rational-choice model from destruction at the hands of behavioral economics. But in fact these are dimensions of rationality that I have been writing about for many years.[25]

One more step is necessary to give a complete account of the concept of fairness as used by JST. We must consider why a person may become indignant not only when his own rights are infringed but also when another person's rights are infringed. The key is altruism (so positive altruism lies at the base of negative altruism). This is easy to understand in the case in which the person whose rights have been infringed is a relative or close friend. But it is operative even when he is a stranger. For in that case the "fooling the instincts" phenomenon is in play and the attenuated but nonetheless positive altruistic feelings that we have even for complete strangers engenders a corresponding indignation if the stranger's rights are infringed. This analysis may explain what has long puzzled moral philosophers—why we are more indignant at the driver who runs down a child carelessly than at the more careless driver who through sheer luck misses the child.[26] The altruistic in-

24. *See* J. Hirshleifer, *Natural Economy versus Political Economy*, 1 J. SOC. & BIOLOGICAL STRUCTURES 319, 332, 334 (1978); Robert L. Trivers, *The Evolution of Reciprocal Altruism*, 46 Q. REV. BIOLOGY 35, 49 (1971).

25. *See, e.g.*, William M. Landes & Richard A. Posner, *Altruism in Law and Economics*, 90 AM. ECON. REV., May 1978, Papers & Proceedings, at 4 → Richard A. Posner, *Retribution and Related Concepts of Punishment*, 9 J. LEGAL STUD. 71 (1980).

26. *See, e.g.*, BERNARD WILLIAMS, MAKING SENSE OF HUMANITY, AND OTHER PHILOSOPHICAL PAPERS 1982–1993, at 241 (1995); BERNARD WILLIAMS, MORAL LUCK: PHILOSOPHICAL PAPERS 1973–1980, at 20 (1981) (analyzing the interplay between luck or chance and moral judgments).

stinct is triggered in the first case but not the second. We are hurt by the loss of the child even though it is not our own child.

IV. THE ULTIMATUM GAME AND THE ENDOWMENT EFFECT

The ultimatum game[27] is one of JST's principal examples of what they consider the empirical failures of rational-choice economics. The explanation they give for why the proposer will offer more than a penny, even though a refusal of his offer would make the respondent worse off by that penny, is that proposer and respondent share a concept of fairness.[28] This is just a labeling of the result of the game; the process that generates it remains mysterious in their analysis. We can make progress by viewing the game through the lens of negative altruism. To gain anything from playing the game, the proposer has to make an offer generous enough to induce the respondent to accept. As this necessity exists whether or not the proposer has any sense of fairness, there is nothing even remotely irrational—hence nothing that requires a concept of fairness to explain—about his offering more than a penny. So we can forget about the proposer and concentrate on the respondent, and ask, "Why won't he take the penny?" For the same reason that I would not kiss Professor Sunstein's feet for $1,000. The offer of the penny would signal to the respondent the proposer's belief that the respondent holds a low supposal of his own worth, that he is grateful for scraps, that he accepts being ill-used, that he has no pride, no sense of honor. This weak-spirited creature is just the type who in a prepolitical, vengeance-based society would have been stamped on by his aggressive neighbors and, thus deprived of resources, have left few offspring. The neighbors would have trampled on his rights because they would have known that he had no sense of having any rights and was in any event too diffident to act in defense of them. It is from the aggressive neighbors that we moderns are descended, and we reveal our prideful genetic heritage in a wide variety of settings, one of which is the ultimatum game. The game itself shows that this heritage continues to be rational in a range of instances—it is what enables the respondents in the ultimatum game, and their counterparts in analogous real-world situations, to avoid complete defeat. The vengeful spirit was the basis of the nuclear deterrent that contributed, perhaps vitally, to maintaining a semblance of world peace (or at least to avoiding a world war) for half a century. It is the basis of most reporting of crime in those situations, which are common, in which neither the victim of the crime nor any other potential reporter or witness of it anticipates a selfish gain from reporting.

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27. The game is simple. A is given an amount of money. He can offer as little or as much of it as he pleases to B. If B accepts the offer, A gets to keep the rest; if B refuses, neither gets anything.

28. JST, *supra* note 1, at 1492.

I would like to see a series of ultimatum-game experiments in which the proposers make the same offers to respondents who differ both among themselves and from the proposers in age, sex, income, and education, viewed as proxies for or sources of differences in status, self-esteem, or other plausible correlates of the sense of pride that causes respondents in the game to reject chintzy offers. We might learn how closely the ultimatum game corresponds to status struggles among chimpanzees and other monkeys who resemble our proto-human ancestors.

I mentioned signaling, but not to suggest that the respondent in the ultimatum game is seeking a reputation for toughness because he expects to be playing the game again with the same proposer. That would be an easy case for rational-choice analysis. The difficult case is where there is no prospect of repeat play. In that case the response of turning down an insultingly low offer is in a narrow sense emotional rather than rational, but in a broader sense rational because the emotion that generates it is part of a cognitive-emotional complex that enables the making of commitments that are rational ex ante.

The endowment effect is related to the ultimatum game. The only "rights" in prehistoric society would have been possessory rights, and so people who didn't cling to what they had would have been at a disadvantage. This may explain the coffee-mugs experiment discussed by JST. The example itself illustrates a quirk, a vestige of a rational adaptation to a vanished situation, though I shall suggest a fully rational explanation shortly. The more common case of the endowment effect the case in which the good that one is asked to part with has been one's own for a long time, can be understood in straightforward rational-choice terms.[29] To begin with, anyone who owns a good, except the marginal owner, values it above the market price. This implies that owners of the good as a class value it more than nonowners do—if they didn't, they would sell it to the nonowners. A further explanation draws on the idea of rational adaptive preference—we rationally adapt to what we have, and would incur new costs to adapt to something new. A person who is blinded in an accident must incur costs to adapt to being blinded. But a blind person who through a doctor's negligence fails to regain his sight has already adapted to being blind, so his loss of (prospective) sight is less than the sighted person's loss of sight.

It may be objected that to speak of adaptive preferences, as of multiple selves, violates the rational-choice economist's normal assumption of stable preferences. But obviously people's preferences change, so all the economist can mean by the assumption is that ordinarily it is facile and uninteresting to explain a change in behavior (for example, a fall in demand for some

29. The analysis that follows is drawn from RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 20, 95–96 (5th ed., 1998).

good as a result of an increase in its relative price) by saying that peoples' preferences changed; that is like "explaining" irrational behavior by saying that people aren't always rational—which is a true statement, but not a helpful one. Rejecting the facile invocation of preference changes doesn't place beyond the bounds of economics the explanation for why certain undoubted preference changes do occur.[30]

Surveys of attitudes toward national parks and other recreational public lands reveal dramatic endowment effects. Asked how much money they would demand to sell their rights to use such lands, people give much higher figures than when they are asked what they would offer to buy such rights. This disparity need not be thought irrational. It may simply reflect the absence of close substitutes for access to national parks.[31] The absence of a close substitute for a good implies that it could not be replaced easily if it were lost. And so the owner demands a high price to part with it. But if he doesn't own it, he may be unwilling to pay a high price for it because he doesn't know what he is missing, since by hypothesis nothing he owns is much like it.

These examples not only are more important than the coffee-mugs game but also offer greater insight into normal human behavior. In a modern economy, the sale of goods and services (other than labor) is to a considerable extent professionalized. Most individuals, including virtually all university students—the principal experimental subjects of behavioral economics, which relies much more heavily than standard economics does on experiments—are buyers but not sellers. When we do have something to sell, we usually sell through middlemen, such as real estate brokers, rather than directly to the ultimate consumer. Experimental situations in which the subjects are asked to trade with each other are artificial, and so we cannot have much confidence that the results generalize to real markets.

If the endowment effect makes sense from a rational-choice perspective in a variety of real-world settings, the coffee-mugs example may illustrate nothing more mysterious than the operation of habit—which is not irrational. Habitual behavior occurs when cost and benefit are time-dependent and cost is negatively related to time and benefit positively related to it.[32] Not only is it cheaper to brush one's teeth after brushing has become habitual, but to stop brushing (maybe in response to convincing evidence that it was actually bad

30. On the economics of preference formation, see generally GARY S. BECKER, ACCOUNTING FOR TASTES (1996).

31. *See* Daniel S. Levy & David Friedman, *The Revenge of the Redwoods? Reconsidering Property Rights and the Economic Allocation of Natural Resources*, 61 U. CHI. L. REV. 493, 494-95 (1994).

32. Marcel Boyer, *Rational Demand and Expenditures Patterns under Habit Formation*, 31 J. ECON. THEORY 27 (1983). The obverse case—cost positively, benefit negatively, related to time—is that of boredom.

for one's teeth) would make one uncomfortable. Breaking a habit, like breaking an addiction (an extreme example of habit), causes withdrawal symptoms, though in the case of a mere habit they usually are slight and fleeting. Habit-formation is one way in which "learning by doing" works; tasks are performed more quickly and with less effort when they become habitual. If acting in accordance with the endowment effect is rationally habitual because of the real-world examples given earlier (such as rational adaptive preference), this may explain the outcome of the coffee-mugs experiment, even though that outcome is irrational if habit is ignored.

My analysis of the ultimatum game and the endowment effect has made use of signaling theory, game theory, and the economics of information and of habit, but all these now are accepted, and most of them familiar, elements of rational-choice models. Of course, enriching the rational-choice model runs a risk similar to that of behavioral economics, of explaining nothing by explaining everything. On this ground there are still economists who resist incorporating risk aversion into the utility function. But the success of modern economists in enriching the simplest rational-choice models, not only with risk aversion and risk preference but also with altruism, time preference, positive information costs, and strategic and habitual behavior, without sacrificing falsifiability, furnishes a basis for optimism about the power and resilience of rational-choice economics.

There is still another point: Rational-choice economics makes the analyst think hard. Faced with anomalous behavior, the rational-choice economist, unlike the behavioral economist, doesn't respond, "Of course, what do you expect?" Troubled, puzzled, challenged, he wracks his brains for some theoretical extension or modification that will accommodate the seeming anomaly to the assumption of rationality. From these efforts have come the advances in economic theory listed in the preceding paragraph. It is possible that the major fruit of behavioral economics will be the stimulus it provides to new and better rational-choice theorizing.

V. CRIME, OPTIMISM, AND CHILDBIRTH

That JST have given up on rational-choice theory too soon is further shown by their discussion of criminals' discounting of future punishments. They believe that such discounting is hyperbolic and that this refutes the rational-choice approach to crime and punishment. I am not convinced, although for the reason explained earlier I do not regard hyperbolic discounting as necessarily inconsistent with rationality in any event.

A peculiarity of criminal punishment, when it takes the form of imprisonment, is that a reduction in its probability cannot easily be offset by an increase in its severity. The only way to increase severity is to add prison time at the end of the criminal's sentence. If the sentence is already long,

any increments of length will have little weight in the criminal's calculations, simply because of ordinary, not hyperbolic, discounting. For example, lengthening a prison sentence from twenty to twenty-five years will increase its disutility (in "present value" terms, that is, as reckoned by the defendant when he is deciding whether to commit a criminal act that would expose him to such a punishment) by much less than twenty-five percent; at a discount rate of ten percent, the increase will be only about six percent.

But I am willing to grant that many criminals are hyperbolic discounters rather than merely ordinary discounters. Indeed I think it likely. For we must consider, as JST do not, the selection effects of a criminal punishment system. If the system is designed to deter, then criminals—the part of the population that is not deterred—will not be a random draw from the population, just as lunatics are not a random draw. We can expect the undeterrable to have peculiar traits, including, in a system in which punishment takes the form of imprisonment, an abnormal indifference to future consequences. Most criminals are not very intelligent, and this may make it hard for them to imagine future pains. This does not show that a criminal justice system should be designed on the assumption that the population of potential criminals is dominated by hyperbolic discounters.

What is true is that any personal discount rate[33] higher than necessary to adjust for the risk of death is suspect from the narrowest rational-choice standpoint, as it implies an arbitrary preference for present over future consumption. But this present orientation can be profitably analyzed in terms of rational choice, as I suggested earlier, either through the concept of multiple selves (the present self is in control of a person's present actions, and disvalues the welfare of the person's future selves) or because of information costs that make it difficult to imagine our state of mind in the future.[34]

Selection effects also explain some, at least, of the phenomenon of overoptimism. People are more likely to want to enter an activity if they think they will do well in it. But the competition among such people will reduce the likelihood of success, so that viewed ex post their original expectations will seem inflated.

JST's most interesting, and from the standpoint of law and public policy potentially most important, example of a departure from rationality is that of mandated childbirth health insurance. The fact that wages in the study they

33. A term I use to distinguish interest rates, which are a function not only of time preferences, default risk, and administrative costs but also of the supply of capital, from nonmonetary discount rates. Interest rates might be high not because people had a strong preference for present over future consumption but because capital was scarce for unrelated reasons.

34. *See* BECKER, *supra* note 30, at 10–12; Gary S. Becker & Casey B. Mulligan, *On the Endogenous Determination of Time Preference*, 112 Q.J. ECON. 729 (1997).

cite[35] fell by the full cost of the coverage does imply that the workers valued the coverage at its full cost even though, before it was imposed on them, they would not have valued it that highly. The implication that JST draw is that the imposition of the coverage changed the women's preferences; something they didn't like before they had it they did like once they got it, just as in the case of the coffee mugs.

Yet their interpretation of the study is at best suggestive:

1. It is based only on the one study, the results of which could be due to noise in the data—which is why a single study provides only a weak basis for conclusions.
2. There is once again a selection problem—or rather two such problems:
   a. Women planning to have children will be attracted to employments in which childbirth insurance is available,[36] thus competing down wages.
   b. Given the insurance, women will be more likely to have children, and this will make them less productive and lower their wages.
3. The author of the study speculates that the insurance may have resulted in an excessive number of Cesarean sections from a cost-benefit standpoint[37]—indicating a thoroughly rational reaction by the women and the medical profession to the availability of a new funding source for obstetrical procedures.
4. Not the study itself (which does not mention behavioral economics) but JST's analysis of it arbitrarily combines the premises of behavioral economics with those of rational-choice economics. JST assume of course that employees are governed in their employment behavior by the endowment effect. But they also assume that if, before the law made childbirth insurance coverage mandatory, employees had valued such insurance at its cost or higher, employers would have offered it without any prodding by government. The fact that they did not (except rarely) offer it is taken by JST to imply that the employees did not value it at more than its cost. But this is to assume that before the law was passed employers and employees alike were perfectly rational. Of course, before the law was passed, the endowment effect was not in play. But the endowment effect is only one of a number of irrationalities that JST believe, or ought as a matter of consistency to believe, pervade labor mar-

35. Jonathan Gruber, *The Incidence of Mandated Maternity Benefits*, 84 AM. ECON. REV. 622 (1994).

36. It is unclear from Gruber's article what exceptions if any the state laws that were his principal subject made in coverage. But even if all employed people were fully covered, the laws would tend to attract women of childbearing age and intentions from the home into paid employment.

37. Gruber, *supra* note 35, at 640.

kets, just like other markets. Why do they think that none of them was operative before the imposition of mandatory childbirth insurance?

Despite these reservations, I accept that the study provides some support for the existence of the endowment effect, and anyway I gave other examples of the effect—I don't question its existence. And so I repeat what I said at the outset: JST are on to something. But what they are on to is a set of phenomena that rational-choice economics and evolutionary biology, systems of thought that have parallel structures, being both founded on the concept of rationality that I defined at the outset, can, I predict, do more with than behavioral economics as conceived by JST. I have emphasized the evolutionary biology of what they call "fairness," but the cognitive quirks and weakness of will may also be explicable in terms of evolutionary biology though not of rational choice. We need only imagine the kind of cognitive equipment that would be optimal in the prehistoric environment to which early man adapted: when thinking oriented to the distant future or to understanding low-probability events or to balancing immediate impressions against subtler inferences would have had only limited survival value; when language was in so rudimentary a state that a picture was indeed worth a thousand words (hence the availability heuristic, as illustrated by the reaction to horror movies, the "seen" live lobster, and pornography); when optimism was essential to keep one going in conditions of wretched adversity; and when emotionality in such forms as moralistic indignation was indispensable to the making of credible commitments essential to survival. The adaptations that were rational then may not be entirely rational now.

VI. THE EMPIRICAL EVIDENCE FOR JST'S CLAIMS

JST make exaggerated claims for the empirical robustness of behavioral economics. The problem of extrapolating to normal human behavior from behavior in unusual experimental settings, as with the trading of the coffee mugs, is obvious, and is not addressed in the paper. One would like to know the theoretical or empirical basis for supposing that the experimental environment is relevantly similar to the real world. That would be the first question an experimental scientist would address. Selection effects suggest that the experimental and real-world environments will differ systematically. The experimental subjects are chosen more or less randomly; but people are not randomly sorted to jobs and other activities. People who cannot calculate probabilities will either avoid gambling, if they know their cognitive weakness, or, if they do not, will soon be wiped out and thus be forced to discontinue gambling. People who are unusually "fair" will avoid (or, again, be forced out of) roughhouse activities—including highly competitive businesses, trial lawyering, and the academic rat race. Hyperbolic discounters will avoid the financial-services industry. These selection effects will not

work perfectly, but they are likely to drive a big wedge between experimental and real-world consequences of irrationality. An interesting study would be to compare the subsequent career paths, and earnings, of students who score high in rationality in experiments conducted by behavioral economists with those who score low.

The nonexperimental evidence that JST discuss is thin (although there is some more evidence in the studies they cite in their footnotes but do not discuss). I mentioned the study of mandated childbirth insurance, which is a good deal less conclusive than JST suggest. To show that parties to lawsuits do not recontract after the plaintiff has succeeded in obtaining an injunction, which is offered as proof that the Coase Theorem is false,[38] they rely on an unpublished, and I believe uncompleted, study by Ward Farnsworth that has a sample size (20) too small to be statistically significant. And if the courts in his study "got it right"—that is, granted injunctions only in cases in which the plaintiff had more to gain from it than the defendant had to lose from it—there would be be no occasion for a corrective transaction. This possibility will complicate the interpretation of Farnsworth's findings even if, when the study is completed, they turn out to be as JST hope. In fact, I am about to suggest that the opposite findings would pose a greater challenge to rational-choice theory.

JST generalize from Farnsworth's study that "[o]nce people have received a court judgment, they are unwilling to negotiate with the opposing party."[39] In fact it is not unusual for parties to settle a case after judgment in the trial court, rather than take their chances with an appeal.[40] But maybe JST meant to confine their observation to cases in which a judgment has become final after exhaustion of appellate remedies. If so, it greatly weakens the inference they wish to draw from Farnsworth's study, that the endowment effect prevents advantageous postjudgment transfers. If a case that has become final through exhaustion of appellate remedies could have been settled, because the remedy sought by the plaintiff would cost the defendant

38. I don't think JST actually mean that the theorem is false; they are speaking loosely. The theorem is a tautology. *See* Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960). They must mean that if the theorem is recast as the hypothesis that the assignment of property rights is irrelevant if transaction costs are lower than the benefits of reassigning the rights, the hypothesis is false.

39. JST, *supra* note 1, at 1500.

40. Federal courts of appeals have settlement officers to facilitate the settlement of cases on appeal. The settlement offices, usually of two or three officers, are expected to reduce the judges' caseload by about ten percent, see RICHARD A. POSNER, THE FEDERAL COURTS: CHALLENGE AND REFORM 239–240 (1996), though this is probably overoptimistic. Many cases are settled on appeal without the help of the settlement officers, even though the cost savings from such a settlement are limited, since most of the expenses of litigation will have been incurred already. About a quarter of all cases filed in the federal courts of appeals are disposed of, before full briefing, without judicial action. *See id.* at 72 tbl.3.6. An unknown, but not trivial, percentage of these are settled, along with a very small percentage of cases briefed and argued but not yet decided.

more than it would benefit the plaintiff, the case would have been settled earlier—at the latest after the judgment in the trial court and before the appeal. And this point suggests that Farnsworth's findings (if they hold up) vindicate rather than challenge rationality. For if the parties waited until after all appeal rights had been exhausted to work out the value-maximizing resolution of their dispute—if final judgments turned out to be the preliminary to negotiations that undid them—it would mean that the parties had irrationally failed to economize on their expenses of litigation.

In support of a radical proposal for curtailing tort liability by requiring plaintiffs to bear a heightened burden of proving negligence, JST rely on impressionistic evidence that juries are too favorable to plaintiff. JST ascribe this alleged favoritism to the hindsight fallacy.[41] They glide over the possibility that it might be actuated by considerations of "fairness," perhaps distributive in nature—the sense that defendants or their insurers have "deep pockets" to pay for the plaintiff's injuries. Appeals to fairness are ubiquitous in tort cases.[42] But my main criticism is of basing so radical a proposal on such limited evidence.

The authors commend, without any evidence, proposals for entrusting risk regulation to insulated bodies of civil servants (shades of the Progressive era and the New Deal) without explaining why these civil servants could be expected to be immune from cognitive quirks and weakness of will.[43]

In support of an argument that the availability heuristic has given rise to "legislation by anecdote," JST offer their own anecdote, about how the highly publicized rash of illnesses of people living near Love Canal gave rise to the Superfund law: "The behavioral account of Superfund is that the availability of 'Love Canal' as a symbol for the problem of abandoned hazardous waste dumps greatly intensified public concern, to the point where a legislative response became nearly inevitable, no matter what the actual facts might be."[44] I do not understand what this narrative, plausible though it is, owes to behavioral economics or to any other organized body of thought. In this example, the "availability heuristic" is equated to anecdotal evidence. It is entirely rational for people to rely on anecdotal evidence in the absence of better evidence, just as it is rational for them to rely on an advocate's known

41. Oddly, the authors' own discussion of the equity-premium puzzle is an example of the hindsight fallacy. They infer that people are irrationally risk averse from the fact, known only in hindsight, that if you had invested $1 in stocks rather than bonds in 1926 your choice would have been triumphantly vindicated in 1997 by the performance of the stock market during that interval.

42. *See, e.g.*, James A. Henderson, *Judicial Reliance on Public Policy: An Empirical Analysis of Products Liability Decisions*, 59 GEO. WASH. L. REV. 1570, 1595-97 (1991).

43. Perhaps "commend" is too strong; but I take JST's reference to "Justice Breyer's plea for an insulated body of specialized civil servants, entrusted with the job of comparing risks and ensuring that resources are devoted to the most serious problems," JST, *supra* note 1, at 1544, to be endorsement.

44. *Id.* at 1521.

character for probity in the absence of evidence that would enable the truth of his proposals to be verified directly. Limited information must not be confused with irrationality. When people react to a plane crash by refusing to fly for a period of time, they are not necessarily acting irrationally; for until the cause of the crash is known, there is some unknown probability that it is a portent of worsening airline safety. People who exaggerate the risk of being murdered because the media overreport death from murder relative to other deaths are not irrational; they simply do not have enough information to form a correct assessment of the risk. And imitative behavior ("conformation") is not irrational, because the behavior of other people is often a reliable guide to what you should do to maximize your own welfare, unless you think you have very different preferences, or face different constraints, from other people.

JST cite a study which hypothesized that each side in teacher collective-bargaining negotiations, in seeking to bolster its negotiating position with data on teachers' wages in comparable communities, would "adopt self-serving judgments about which communities are 'comparable,' and impasses may result from such judgments."[45] This is about as surprising as the fact that each side in a lawsuit will make self-serving judgments about which cases provide the closest analogies to the case at hand or which facts are most probative. JST contend that the strategic incentive to make self-serving judgments was eliminated in the collective-bargaining study by the fact that "the only audience for the responses in the study was the study's authors."[46] This contention is naive. Negotiators are unlikely to drop their (rational) biases when talking to professors, especially since they may lack confidence that their disclosures will remain confidential. JST are correct that there is such a thing as role bias, that it is common among lawyers and negotiators, and that it may be a factor in why not all cases settle, though most do. But the particular study adds nothing to the intuition.

To demonstrate the power of behavioral economics to explain laws that stump the conventional economist, JST merge usury laws, which have nothing to do with shortages; the avoidance of price gouging, which is not a legal imposition but a presumably compensated buffer of the risks faced by customers; and laws against ticket scalping, which are in force in fewer than half the states and which coexist mysteriously with laws permitting ticket brokers to buy in bulk from the theater and resell at "scalpers" prices.

The lack of relation between usury laws and the other two types of law is shown by the fact that there is no "reference point" interest rate and therefore no benchmark for triggering the sense of indignation that is the relevant component of JST's concept of fairness. Lenders do not typically refuse to

45. *Id.* at 1502.

46. *Id.*

lend to risky borrowers at above-market rates, whatever exactly "market" means in this context. Banks quote a prime rate, but not necessarily the same rate, to their best customers and charge everyone else—that is, the riskier borrowers—more. (All a "prime rate" means is the bank's best interest rate for unsecured loans.) Mortgage lenders charge varying numbers of points. Bonds, a form of loan, are rated for risk, and the lower-rated bonds pay higher interest rates without anyone crying "usury!" Credit card interest is much higher than bank-loan interest. Long-term interest rates usually differ from short-term rates. Interest rates on secured loans are lower than those on unsecured loans. Interest rates fluctuate with inflation, and of course with the demand for and the supply of capital. Even in consumer credit transactions, the focus of the modern usury laws, there is no uniformity in interest rates, as many of my examples show. And can these laws have any effect today, when one considers that credit card and installment credit interest rates often approach twenty percent yet are perfectly lawful?

What may have misled JST is that if a borrower has a really high risk of default, there may be no interest rate that will make the loan worthwhile to either lender or borrower. This is especially likely because the higher the interest rate, the greater the risk of default, since an interest rate is a fixed rather than a variable cost of the borrower. This is why the riskiest loans and resulting astronomical interest rates are the domain of the loan shark, who, facing an unusually high risk of default, employs the threat of force in lieu of the milder remedies that are all that are available to the legal lender.

JST suggest that the same concept of fairness that explains usury laws, price-gouging laws, and ticket-scalping laws explains laws forbidding prostitution and refusing to enforce surrogate-motherhood contracts, laws forbidding the sale of body parts and political votes, and laws refusing to enforce the contracting around of laws against race and sex. This is a heterogeneous collection of laws, and to refer them to "pervasive judgments about fairness"[47] is not to explain them. JST must explain what all these laws have in common, must give some form and content to their idea of "fairness," and must consider more carefully the possibility of competing explanations for the laws, such as that they serve politically powerful special interests or are a product of misunderstandings unrelated to any of the three "boundeds." (Voters have little incentive to become well informed about policies, especially since they vote for representatives rather than for the policies themselves.) For example, limits on adoption prices (limits inaccurately described as bans on "baby selling") are supported by nonprofit adoption agencies, which are concerned about competition from profit-making adoption agencies, and by public ignorance of the consequences of price ceilings.

47. *Id.* at 1516.

VII. NORMATIVE ISSUES

I have been focusing on the significance of behavioral economics for positive analysis, but I wish to note briefly its normative implications—if any. On the one hand, the picture of the human being that JST draw is one of unstable preferences and, what turns out to be related, infinite manipulability. If you give a worker childbirth coverage, she'll like it (endowment effect); but if you don't give it to her, she'll dislike it (more precisely, won't want to pay for it in lower wages). If you describe the threat of breast cancer to a woman in one way, she'll want a mammogram, but if you describe it in another although logically equivalent way, she won't. It seems then that the politically insulated corps of experts that JST favor would be charged with determining the populace's authentic preferences, which sounds totalitarian to me. On the other hand, nothing in JST's analysis exempts "experts" from the cognitive quirks, from weakness of will, or from concerns with fairness. The expert, too, is behavioral man. Behavioral man behaves in unpredictable ways. Dare we vest responsibility for curing irrationality in the irrational?

One might have thought that behavioral economics had at least one clear normative implication: that efforts should be made through education and perhaps psychiatry to cure the cognitive quirks and weakness of will that prevent people from acting rationally with no offsetting gains. Even if as I believe the sunk-costs fallacy has biological roots, it should not be impossible to educate people out of it. Behavioral therapy has enabled many people to overcome their fear of flying, which I suspect has more tenacious biological roots. JST treat the irrationalities that form the subject matter of behavioral economics as unalterable constituents of human personality. All their suggestions for legal reform are of devices for getting around, rather than dispelling, our irrational tendencies—which, fortunately, they exaggerate.