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2001

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Recommended Citation

Stake, Jeffrey E., "Can Evolutionary Science Contribute to Discussions of Law?" (2001). *Articles by Maurer Faculty*. 203.

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COMMENT: CAN EVOLUTIONARY SCIENCE CONTRIBUTE TO DISCUSSIONS OF LAW?

Jeffrey Evans Stake*

ABSTRACT: Evolutionary theory can be helpful in understanding the law and determining what it should be. There are two ways in which the evolutionary perspective differs from an economic perspective on law. Not only does the evolutionary approach shift our attention from the world today to the environment of evolutionary adaptation, it shifts our focus from rational individuals to rational genes and from rational behaviors to rational design of mental architecture. Finally, the law of law's leverage makes predictions about the relative elasticities of demand for all sorts of behaviors, including those that did and did not exist in the environment of evolutionary adaptation.

CITATION: Jeffrey Evans Stake, Can Evolutionary Science Contribute to Discussions of Law?, 41 *Jurimetrics J.* 379–384 (2001).

What can human behavioral biology and evolutionary theory add to our analysis of law? What do we gain when we apply behavioral economics or evolutionary psychology to legal issues? It is certainly not the style or method, for the method of analysis seems quite familiar. Legal policymakers have long used economics to predict human behavioral responses to legal rules. As with economic analysis, there are both positive and normative applications of evolutionary analysis to law.

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Take, as an example, the Trivers-Willard hypothesis,¹ derived from evolutionary theory. This hypothesis asserts that parental investment in offspring depends on the resources available to the parents and the sex of the offspring. Over evolutionary time, high-resource parents produced the greatest number of descendants by producing an alpha male, which they accomplished by investing heavily in one male offspring. Low-resource parents did not have the resources to produce alpha males. They produced the greatest number of descendants by making sure that their female offspring survived to the time of reproduction, which required them to invest their limited resources in those female offspring. Applied to humans, the hypothesis predicts that as parents get richer, they invest proportionately more in their sons. As a matter of positive analysis, this hypothesis explains the rules of primogeniture, which favor a single male.² As a matter of normative analysis, the Trivers-Willard hypothesis stimulates us to ask whether we should, on fairness or other grounds, follow the English common law rule of “advancements,” which tends to compensate for unequal lifetime giving.³ Thus, evolutionary analysis can help us understand the law, and it can clarify our instrumental goals and improve our ability to reach them. Better prediction of human behavior leads to better policy. In short, behavioral biology, like economics, helps us with both the “is” and the “ought” dimensions of an issue.

Critics might complain that evolutionary psychology and behavioral economics are not understood well enough to be used in legal policymaking. But even unproved theory can be useful in analyzing legal issues. For three reasons, the fact that some evolutionary proposition has not yet been confirmed ought not enjoin theorists from stirring that theory into legal discussion. First, mere theory may improve our appreciation of the normative benefits of existing rules and provide a reason to hesitate before implementing reforms. Even if the Trivers-Willard hypothesis is only a theory, the possibility that people behave in a way consistent with the hypothesis offers a reason for adhering to the traditional doctrine of advancements.

Second, philosophical and behavioral theories have influenced the law and formed the foundation for law reform proposals without having been proved true. Reformers theorize about what will and will not happen if the law is changed. For instance, reformers cite economic theory for the proposition that people will not make gifts that reduce the present value of assets. Evolutionary theory, on the other hand, suggests that people might indeed make value-reducing gifts.⁴ Where

1. R.L. Trivers & D.E. Willard, *Natural Selection of Parental Ability to Vary the Sex Ratio of Offspring*, 179 *SCIENCE* 90–91 (1973).

2. Sarah Blaffer Hrdy & Debra S. Judge, *Darwin and the Puzzle of Primogeniture*, 4 *HUMAN NATURE* 1, 21–22 (1993).

3. LAWRENCE W. WAGGONER ET AL., *FAMILY PROPERTY LAW* 73 (2d ed. 1997).

4. Jeffrey E. Stake, *Darwin, Donations, and the Illusion of Dead Hand Control*, 64 *TUL. L. REV.* 705, 725 (1990).

other mere theory has been used, evolutionary theory can be taken into account as well.

Third, lawmakers have had to make decisions without proof of the consequences. For example, the judges hearing *Pierson v. Post*⁵ had to decide whether title in a fox belonged to the first person to make hot pursuit or the first person to grab it. The majority decided to require actual physical control. Recent evidence suggests that something important might happen in our brains when a person actually grasps an item of food.⁶ But judges in 1805 could not wait to find a neurological basis for possession before handing down their decision. They had to make a guess as to what would work best. Today too, judges have to decide cases on incomplete information. If a proposition about human response seems likely to be true, the judge ought to suppose it is true even if his statistical confidence is very low.⁷

Another criticism of the evolutionary perspective is that it takes the same reductionistic and individualized viewpoint as economics. Evolution, like economics, takes a selfish perspective because it examines behavior of people by looking at what would be good for them or for their genes. But evolutionary analysis picks up where economics leaves off. Although scholars have looked at law's role in shaping preferences, much of law and economics treats preferences as exogenous and pays them little attention.⁸ Evolutionary analysis helps us understand preferences and offers insights unavailable from economics.

Natural selection makes some behavioral responses to situations more likely than others. Those who stood still in front of charging rhinoceroses passed their genes to fewer offspring. Needless to say, the brain has a big role in determining behaviors. For that reason, parts of the brain are subject to selection by the environment. We should expect to find modules in the brain that trigger adaptive behaviors. In short, because preferences lead to behaviors, preferences cannot all be random. An easy example is our taste for sugars. Humans need calories. Foods high in sugars provide more calories for the same gathering effort than vegetation lacking sugars. People who attempted to find and eat sugary foods had a better chance of storing sufficient calories to survive long enough to reproduce. People to whom sugar tasted good were more likely to locate and eat

5. 3 Cai. R. 175 (N. Y. Sup. Ct. 1805).

6. See Giacomo Rizzolatti et al., *Premotor Cortex and the Recognition of Motor Actions*, 3 COGNITIVE BRAIN RES. 131, 134–36 (1996).

7. Of course, the judge should be cautious in doing this. If two independent assumptions need to be made for plaintiff to prevail and they are each slightly more likely true than not, then the better guess is that taken together they are not true. If there are differences in the harm that will ensue if the judge errs in one direction or the other, those differences also should be taken into account.

8. See Kenneth G. Dau-Schmidt, *An Economic Analysis of the Criminal Law as a Preference-Shaping Policy*, 1990 DUKE L.J. 1 (1990). But see GARY S. BECKER, ACCOUNTING FOR TASTES (1996).

sugars. So most of us descend from people who liked sugars; we inherited genes that make sugary foods appetizing. Many of the genes for liking sweets express themselves in the brain. We have a mental module that makes us enjoy sweets.⁹

Owen Jones uses the sweet food example to show that behavior that does not look rational today might have been rational in the “environment of evolutionary adaptation (EEA).”¹⁰ In America today, more health problems are caused by excessive calories than by insufficient caloric intake. Jones suggests that our sweet-eating proclivity, which is irrational today, was rational during the EEA.¹¹ This idea of time-shifted rationality lies at the heart of the difference between the economic and evolutionary perspectives on law.

There is more to Jones’s time-shifted rationality than meets the eye. Time has shifted, but the perspective has changed in other ways as well. Evolutionary analysis focuses on genes rather than people.¹² As an example of this difference between economic and evolutionary analysis, consider an economic critique of the Rule against Perpetuities.¹³ The argument is that donors (settlers and testators) are not likely to break ownership into packages of rights that diminish the net present value to the recipients. After all, why would anyone want to reduce the value of a gift to others? This position seems to be gaining ground, as witnessed by the fact that the Rule against Perpetuities has been abolished in a growing number of states.¹⁴ However, evolutionary theory does not support a critical part of this economic argument. It could enhance the propagation of certain genes for a person to reduce the present value of the gift when doing so ensures that the gift gets to future progeny. If the gift is large, the assets will do more genetic good if parceled out across the generations rather than being given all to one generation. Whether or not we actually have such a genetic proclivity, the example shows that embedded within time-shifted rationality is a perspectival shift from the phenotype to the genotype.

Another shift implicit in time-shifted rationality is a shift from rationality of behavior to rationality of evolutionary design. The design of the brain can be rational (or optimal) even though the specific decisions made by the brain, the behavioral outcomes, are not. For example, evolutionary psychologists believe that humans have a module for detecting cheaters, people who will not live up to

9. Our biology can also help us refrain from eating too many sweets. If we get sick from eating a food, it might not taste good the next time we eat it. In such cases, our mental module controlling tastes has been reprogrammed by our experience.

10. See Owen Jones, *The Evolution of Irrationality*, 41 JURIMETRICS. J. 147, 160 (2001).

11. See *id.* at 160.

12. See generally RICHARD DAWKINS, *THE SELFISH GENE* (1976).

13. See *Time Property Rights, and the Common Law: Roundtable Discussion*, 64 WASH. U. L.Q. 793, 841–43 (1986).

14. See generally JESSE DUKEMINIER & STANLEY M. JOHANSON, *WILLS, TRUSTS, AND ESTATES* 853–54 (2000).

their end of a bargain.¹⁵ Experiments show that logic puzzles are easier to solve if they are presented as opportunities to detect a cheater.¹⁶ Interestingly, this cheater-detector module causes people to ask questions to detect a cheater even when the problem calls for detecting an altruist.¹⁷ While these studies seem to show that human behavior is illogical or irrational, evolutionary analysis looks at the design of the brain that causes that behavior rather than the behavior itself. The design may be rational even if the resulting behavior is not. If we had enough brain power, we could have modules that would detect both altruists and cheaters. But brains are costly, and nature economizes. Detecting rare altruists was probably not as important to survival in the environment of evolutionary adaptation as avoiding being cheated. It may have been more efficient for nature to design a logically defective module that would rarely fail to detect a cheater and often fail to detect an altruist than to design a logically accurate module that was equally unlikely to fail to detect both the cheater and altruist. Because nature could rationally design us to behave irrationally, we should see time-shifted rationality as referring to the design of our brains rather than the outcome of our behaviors.

As I understand it, Jones's law of law's leverage says that the difficulty of discouraging a behavior in a given context varies with the adaptivity of the behavior in the EEA.¹⁸ Behaviors range continuously on a scale from maladaptive to nonadaptive, to adaptive. The further they are toward the adaptive end of the scale, the harder we must work to reduce their frequency. Two points should be considered. First, context matters. It is possible that, even in the EEA, rape was adaptive in some circumstances and maladaptive in others. Attempting to rape a woman in the presence of her mate who was holding a club would have been maladaptive. On the other hand, raping a woman after the rapist's tribe has just killed all the males in the victim's tribe is more likely to be adaptive. The law of law's leverage suggests that rape in the latter context will be much harder to discourage.¹⁹ If so, we might want to raise the punishment for rape in circumstances in which the perpetrator is least likely to be caught. When it is possible for the brain to contain a module for discriminating between various contexts, the

15. See, e.g., Leda Cosmides & John Tooby, *Cognitive Adaptations for Social Exchange*, in *THE ADAPTED MIND: EVOLUTIONARY PSYCHOLOGY AND THE GENERATION OF CULTURE* 163 (Jerome H. Barkow et al. eds., 1995).

16. *Id.* at 181–206.

17. *Id.* at 224.

18. *Jones, supra* note 10, at 169.

19. There are, of course, at least two possibilities regarding a proclivity to rape. One is that the proclivity is not sensitive to context. In that case, it could continue as a behavioral pattern if it carries a genetic advantage on average. It is also possible, as suggested here, for the proclivity to become highly sensitive to context, a preference felt only in very special circumstances.

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law of law's leverage should include the context of the behavior as a part of any well-defined behavior.

Second, some behaviors will not fit the law of law's leverage well because they had no occasion to occur in the EEA. For example, driving on the left side of a solid yellow line on a highway cannot be called adaptive or maladaptive in the EEA. Hence, we should consider it to be nonadaptive, neither adaptive nor maladaptive, on the ground that the EEA had no opportunity to select in favor of or against the brain modules triggering such behavior.

On further reflection, any behavior (including its context) that existed in the EEA and exists today has been subjected to environmental selection forces for a long time. Hence, it is likely that such behaviors are adaptive to some degree, and we will have some preference for them. On the other hand, behaviors that did not occur in the EEA will be easier to change. But the law of law's leverage is not simply a rule that older behaviors will be harder to change. Among old behaviors there may be differences in degree. It might be harder to change the frequency of running from snakes than to change the frequency of wrestling, even though both behaviors have been around from time immemorial.

Summing up, evolutionary analysis contributes to our understanding of the law and our analysis of what it should be. Properly understood, both the law of law's leverage and the principle of time-shifted rationality provide provocative hypotheses for explaining and improving the law. Jones's article demonstrates that these are exciting times for those interested in applying the latest in knowledge of evolutionary psychology to the ancient problems of the law.