

# THE LONG-TERM PROMISE OF EVOLUTIONARY PSYCHOLOGY FOR THE LAW

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While serving as Secretary of Defense under George W. Bush, Donald Rumsfeld once responded to a reporter's question by famously dividing knowledge into three categories: known knowns (the things we know we know), known unknowns (the things we know that we don't know), and unknown unknowns (the things we don't know we don't know).<sup>1</sup> Though he was criticized for his quip,<sup>2</sup> Rumsfeld's division contains much insight, particularly as it pertains to the scientific enterprise, which is concerned with identifying natural phenomena and then methodically investigating and cataloging the properties of the phenomena into working bodies of knowledge. In other words, science is frequently the process by which unknown unknowns are systematically converted into known knowns. Steven Pinker (citing Noam Chomsky) makes a similar point by contrasting a "mystery" with a "problem":

When we face a problem, we may not know its solution, but we have insight, increasing knowledge, and an inkling of what we are looking for. When we face a mystery, however, we can only stare in wonder and bewilderment, not knowing what an explanation would even look like.<sup>3</sup>

For almost all of human history, the workings of the human mind have been a mystery—an unknown unknown. Because the brain's activity—both functionally and mechanically—is hidden from conscious introspection and has, until recently, been impregnable to existing investigatory methods and technology, scientists and lay observers alike have largely been relegated to

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1. David A. Graham, *Rumsfeld's Knowns and Unknowns: The Intellectual History of a Quip*, ATLANTIC (Mar. 27, 2014), <http://www.theatlantic.com/politics/archive/2014/03/rumsfeld-s-knowns-and-unknowns-the-intellectual-history-of-a-quip/359719/>.

2. E.g., Michiko Kakutani, *Rumsfeld's Defense of Known Decisions*, N.Y. TIMES (Feb. 3, 2011), [http://www.nytimes.com/2011/02/04/books/04book.html?\\_r=0](http://www.nytimes.com/2011/02/04/books/04book.html?_r=0) (Secretary of Defense Rumsfeld made this categorization in discussing "whether Iraq had supplied or was willing to supply terrorists with weapons of mass destruction.").

3. STEVEN PINKER, HOW THE MIND WORKS, at ix (Howard Boyer et al. eds., 1st ed. 1997).

staring in “wonder and bewilderment,” able only to make vaguely-informed conjectures about what exactly was going on up there.<sup>4</sup>

Today, however, a convergent set of modern psychological disciplines and methods—ranging from the brain imaging techniques of the different neuro-disciplines to the computational models of cognitive psychology—is changing this state of affairs, allowing researchers inside the black box of the mind and equipping them with the tools necessary to decode and map the brain’s activity.<sup>5</sup> In doing so, this set of disciplines is also ushering in the transition of human psychology out of the ‘unknown unknown’ category and into the ‘known unknown’ and even, increasingly, the ‘known known’ categories.

This Article is about one branch of this enterprise—evolutionary psychology—and why this branch is of particular long-term importance to the law. As with any behavioral science, the value to the law might seem obvious: since the primary objective of the law—the point of the whole thing—is to manage human behavior, a more complete understanding of the causal mechanisms of human behavior can only improve the institution that seeks to manage it. But to make the idea more concrete, this Article will trace a brief sketch of what evolutionary psychology in particular brings to legal analysis, and why this approach has considerable lasting promise.<sup>6</sup>

## I. THE KNOWN KNOWNS: THE BLUEPRINT

There is nothing magic or incorporeal about how the mind works. Like many other natural phenomena, it only seems mysterious now because we have yet to flesh out a complete schematic of the mechanics and rules governing its operation.<sup>7</sup> Today, for example, we have a working map of the entire human genome and along with it an understanding of how organisms are built and how genetic information is passed from one generation to the

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4. *Id.*

5. *See generally* Am. Psychological Ass’n, *Scanning the Brain*, AM. PSYCHOL. ASS’N (Aug. 2014), <http://www.apa.org/action/resources/research-in-action/scan.aspx>.

6. This Article is not a review in the traditional sense—other scholars have thoroughly catalogued the wide-ranging applicability of an evolutionary analysis of law and convincingly demonstrated its salience. For the seminal treatment, see Owen D. Jones & Timothy H. Goldsmith, *Law and Behavioral Biology*, 105 COLUM. L. REV. 405 (2005). Here, instead, I explore what I believe the logical extension of this potential will mean for the law going forward.

7. *See generally* PINKER, *supra* note 3, at 4 (arguing, “I want to convince you that our minds are not animated by some godly vapor or single wonder principle”).

next.<sup>8</sup> But it was not until 1953 that we even knew what the structure of DNA looked like.<sup>9</sup> The same can be said for many “maps” now considered scientific canon: the geographic world map, the periodic table of the elements, the electromagnetic spectrum, celestial charts, anatomical models, and deep historical timelines—all of which detail information that we now take for granted, but at some point in history must have seemed unfathomably out of reach and as inscrutable to our forbearers as the mind is to us. In actuality, the only meaningful difference between the seemingly mysterious properties that govern thought, and the more concrete rules and operations that govern the replication of DNA, or that govern the motions of the celestial bodies, for example, is simply that we have yet to possess the theoretical foundation or the practical technology to do the work. We are merely further along in one enterprise than the other.

Evolutionary psychology is shifting this state of affairs by giving psychologists the framework necessary for the systematic investigation of the mind.<sup>10</sup> Human psychology is not random; despite the countless ways in which humans could carry out their lives, around the globe and across diverse cultures we find our species engaging in nearly identical pursuits: courting friends, attempting to earn the respect of others, wooing lovers, jockeying for status within a hierarchy, raising children, mourning losses, celebrating accomplishments, negotiating conflicts, and, along the way, finding remarkably similar ways to amuse ourselves in the spaces in between. The universality of these nonrandom pursuits—and, in fact, the very existence of the structure that produces them (i.e., the brain)—makes sense only in light of the evolutionary process, the lone organizational force in an otherwise entropic universe.<sup>11</sup>

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8. See generally *All About the Human Genome Project (HGP)*, NAT'L HUMAN GENOME RESEARCH INST. <https://www.genome.gov/10001772/all-about-the--human-genome-project-hgp/> (last updated Oct. 1, 2015).

9. See generally Leslie A. Pray, *Discovery of DNA Structure and Function: Watson and Crick*, 1 NATURE EDUC. 100 (2008).

10. See generally *Science Briefs: Evolutionary Theory and Psychology*, AM. PSYCHOLOGICAL ASS'N (May 2009), <http://www.apa.org/science/about/psa/2009/05/sci-brief.aspx> (for the 200th anniversary of Charles Darwin's birth, various psychologists and scientists in other fields submitted reflections on the significance of the influence of evolutionary theory on contemporary psychology).

11. John Tooby, Leda Cosmides & H. Clark Barrett, *The Second Law of Thermodynamics is the First Law of Psychology: Evolutionary Developmental Psychology and the Theory of Tandem, Coordinated Inheritances: Comment on Lickliter and Honeycutt*, 129 PSYCHOL. BULL. 858, 862 (2003) (discussing the necessity of natural selection for functional organization and its importance for psychological investigation); see also Theodosius Dobzhansky, *Nothing in Biology Makes Sense Except in the Light of Evolution*, 35 AM. BIOLOGY TEACHER 125 (1973).

To wit, unless and until it is displaced, natural selection remains the state of the art in behavioral theory: the only known natural explanation for the functional order of the human body and, in turn, the human mind.<sup>12</sup> As a consequence, it also remains the most powerful explanatory framework for the nonrandom structure of human behavior and the key to the systematic investigation of human psychology.<sup>13</sup> Just as the discovery of the structure of DNA provided a framework for mapping the human genome, or the discovery of atomic mass provided a framework for constructing the periodic table of the elements, the theory of evolution by natural selection has given psychology a blueprint for charting and cataloguing the functional structure of the brain.<sup>14</sup>

Put in its most simple form, the blueprint is this: to understand a particular psychological process, researchers should start by attempting to first understand its function—what it is for. Often (though not always), this means understanding the proximate role that it played in the survival and reproduction of our ancestors.<sup>15</sup> By uncovering a particular process's function, researchers can then begin generating testable hypotheses about the cognitive machinery that was selected to accomplish this task, and, subsequently, investigate how these diverse programs for biological success interact with one another and with the modern environment to produce the panoply of human behavior that we observe today. Broadly speaking, this is the general framework of an evolutionary approach to understanding the human mind.

Evolutionary psychology is an approach to understanding and investigating *all* human behavior—legally relevant behavior is simply a subset of the overall enterprise. Thirty years of empirically-confirmed

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12. See Tooby, Cosmides & Barrett, *supra* note 11.

13. *Id.*

14. I will discuss that blueprint in some detail here, but for more comprehensive introductions, see PINKER, *supra* note 3, at 21–24 (for a discussion of the process written for the general public); Leda Cosmides & John Tooby, *Evolutionary Psychology: New Perspectives on Cognition and Motivation*, 64 ANN. REV. PSYCHOL. 201, 202–05 (2013) (for a recent, more technical account); Carlton J. Patrick, *A New Synthesis for Law and Emotions: Insights from the Behavioral Sciences*, 47 ARIZ. ST. L.J. 1239, 1251–56 (2015) (for an overview of the process intended for legal scholars).

15. See generally John Tooby & Leda Cosmides, *The Past Explains the Present: Emotional Adaptations and the Structure of Ancestral Environments*, 11 ETHOLOGY & SOCIOBIOLOGY 375, 386–88 (1990) (outlining the general importance and methodologies for looking to the ancestral environment).

hypotheses have borne out the potency of an evolutionary approach,<sup>16</sup> and many of these insights have led to novel (and often counter-intuitive) findings of use to the law. For example:

1. *The Cinderella Effect*. The evolutionary insight that parental love and investment is (*ceteris paribus*) beneficial only if it is directed at genetic offspring led to the empirical finding that the presence of a stepparent in the home was (and remains) the single largest risk factor for child abuse and paedocide.<sup>17</sup>
2. *Intersexual Violence*. The evolutionary insight that male sexual jealousy functions as a mechanism for guarding and monopolizing a woman's reproductive capacity led to the empirical finding that the risk of a woman being a victim in many male-on-female crimes (e.g., spousal homicide, spousal abuse, sexual assault and stalking) increases as the woman's age approaches peak fertility.<sup>18</sup>
3. *The Modal Homicide*. The evolutionary insight that reputation carried extreme fitness consequences in the ancestral environment, especially among pre-reproductive males, led to the finding (and explanation of the finding) that the most common form of homicide among non-relatives is a trivial altercation between young, unmarried (and often jobless) men that escalates in an attempt to save face.<sup>19</sup>
4. *Cultures of Honor*. In a similar vein, the evolutionary insight that an increased risk of exploitation by those around you further increases the importance of reputation

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16. See, e.g., John Tooby & Leda Cosmides, *Conceptual Foundations of Evolutionary Psychology*, in THE HANDBOOK OF EVOLUTIONARY PSYCHOLOGY 5, 5–63 (David M. Buss ed., 2005).

17. See Martin Daly & Margo Wilson, *Is the "Cinderella Effect" Controversial? A Case Study of Evolution-Minded Research and Critiques Thereof*, in FOUNDATIONS OF EVOLUTIONARY PSYCHOLOGY 383, 383 (Charles Crawford & Dennis Krebs eds., 2008).

18. See, e.g., David M. Buss & Joshua D. Duntley, *The Evolution of Intimate Partner Violence*, 16 AGGRESSION & VIOLENT BEHAV. 411, 417 (2011); Joshua D. Duntley & David M. Buss, *The Evolution of Stalking*, 66 SEX ROLES 311, 317 (2012); Owen D. Jones, *Sex, Culture, and the Biology of Rape: Toward Explanation and Prevention*, 87 CALIF. L. REV. 827, 865 (1999); Todd K. Shackelford, David M. Buss & Viviana A. Weekes-Shackelford, *Wife Killings Committed in the Context of a Lovers Triangle*, 25 BASIC & APPLIED SOC. PSYCHOL. 137, 138 (2003).

19. Margo Wilson & Martin Daly, *Competitiveness, Risk Taking, and Violence: The Young Male Syndrome*, 6 ETHOLOGY & SOCIOBIOLOGY 59, 59–69 (1985).

as a formidable retaliator led to the finding that cultures of honor tend to develop in places (e.g., traditionally, the American South) where individuals perceive a weak or absent state incapable of enforcing laws.<sup>20</sup>

5. *Asymmetric Theft*. The evolutionary insight that women place a greater premium on resources in mates than men and, as a result, men engage in greater competition to access resources led to the finding (and explanation of the finding) that, across all cultures, poor men are far more likely than poor women to commit crimes of theft.<sup>21</sup>
6. *Property Instincts*. The evolutionary insight that property intuitions evolved to help resolve potential conflicts of interest of resources (i.e., to coordinate decisions over when to fight and thus avoid needlessly-costly disputes) led to the finding that individuals will favor a prior-possession rule of ownership when disputes over resources are probable, but not when costly disputes are rare.<sup>22</sup>
7. *Selfish Voting*. The evolutionary insight that biological inclusive fitness drives our decision making when it comes to endorsing societal norms led to the finding that—contrary to the dominant view of political scientists—our voting patterns and political views can be largely explained by self-interest.<sup>23</sup>
8. *Erasing Race*. The evolutionary insight that race-based categorizations are a byproduct of psychological machinery that evolved for tracking coalitions led to the finding that race-based categorizations (and thus, presumably race-based discrimination) can be dramatically diminished by

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20. See generally RICHARD E. NISBETT & DOV COHEN, *CULTURE OF HONOR: THE PSYCHOLOGY OF VIOLENCE IN THE SOUTH* (1996) (analyzing the social, cultural, and geographical impacts of reputation on male violence in the American South).

21. See David M. Buss, *The Evolutionary Psychology of Crime*, 1 J. THEORETICAL & PHIL. CRIMINOLOGY 90, 92–93 (2012).

22. See Peter DeScioli & Bart J. Wilson, *The Territorial Foundations of Human Property*, 32 EVOLUTION & HUM. BEHAV. 297, 297 (2011).

23. See generally JASON WEEDEN & ROBERT KURZBAN, *THE HIDDEN AGENDA OF THE POLITICAL MIND: HOW SELF-INTEREST SHAPES OUR OPINIONS AND WHY WE WON'T ADMIT IT* (2014) (discussing the notion that people's political opinions and views are heavily shaped by their own self-interests).



creating alliances uncorrelated with race.<sup>24</sup>

The above list is meant to be illustrative, but it is certainly not exhaustive,<sup>25</sup> and the lasting contribution of evolutionary psychology is not a single finding, or even a collection of findings, but rather the template for investigation that has enabled these discoveries. But the point stands that without knowledge of the evolutionary process—of the engine (genetic propagation) driving natural selection, or of the problems of the ancestral milieu that we evolved to solve—many of these findings would remain unfound or, at the very least, inexplicable.<sup>26</sup>

At the same time, research utilizing an evolutionary approach to human behavior in a legal context has also been somewhat limited in scope. Behavioral scientists interested in legal application have, thus far, focused heavily on criminal behavior, particularly behavior involving physical violence.<sup>27</sup> As a consequence, a large swath of the legal canon that includes questions relating to contract law, property law, administrative law, environmental law, international law, civil and criminal procedure, corporations, and torts, remains unexamined. Thus, as a secondary consequence, this means that legal scholars wishing to incorporate evolutionary approaches to these other areas have been forced to rely

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24. Robert Kurzban, John Tooby & Leda Cosmides, *Can Race Be Erased? Coalitional Computation and Social Categorization*, 98 PROC. NAT'L ACAD. SCI. 15387 (2001).

25. Hundreds of articles, by legal scholars and behavioral scientists alike, have been published to the same effect. For a review, see Owen D. Jones, *Evolutionary Psychology and Law*, in THE HANDBOOK OF EVOLUTIONARY PSYCHOLOGY 953 (David M. Buss ed., 2005). For a comprehensive list, see Owen D. Jones, *Useful Sources: Biology, Evolution, and Law*, VAND. UNIV., [hereinafter Jones, *Useful Sources*], <https://www4.vanderbilt.edu/seal/scholarly-resources/useful-sources/> (last updated Nov. 23, 2016).

26. This is not to suggest that evolutionary psychology has provided us with all of the answers as to why humans do the things that they do—in a legally-relevant context or otherwise. Quite the contrary, the vast majority of the questions of human behavior are unanswered, and many even unasked. Nor am I suggesting that evolutionary theory is even *necessary* to investigate psychology. Because the general scientific method (generate a hypothesis, test it, retain it if it works, discard if it does not) deployed by most behavioral sciences is robust to inaccurate theory, given enough time and enough resources, the correct answers can be achieved through the sheer brute force of trial and error. But what I am suggesting is that the investigative blueprint of evolutionary psychology has given us a powerful set of tools to streamline this process, to add deeper layers of explanation to existing phenomena, and to reduce on the amount of erroneous hypotheses being generated and situate divergent research efforts within a coherent framework—one that unites psychology and the social sciences with the rest of the natural sciences.

27. See generally THE IMPACT OF BEHAVIORAL SCIENCES ON CRIMINAL LAW (Nita A. Farahany ed. 2009); Paul H. Robinson & John M. Darley, *Does Criminal Law Deter? A Behavioral Science Investigation*, 24 OXFORD J. LEGAL STUD. 173 (2004).

principally on either deductive logic or extension by analogy in their application.

Part of the dearth in research is undoubtedly due to disciplinary divides: legal scholars typically lack the infrastructure and formal training necessary to conduct empirical lab work, and psychologists typically lack an understanding of the law that is comprehensive enough to include the more esoteric branches. But an additional explanation may also be simple resource scarcity: (i) the human mind is an unbelievably complex structure, (ii) the evolutionary psychological framework—along with the complementary approaches of neuroscience and cognitive psychology—is still in a nascent stage relative to the sophistication of the undertaking, and (iii) there are only a relatively few investigators employing this approach period, let alone in a legal context. As a result, a large part of the panoply of human psychology—legally-relevant and otherwise—is still waiting to be examined.

## II. THE KNOWN UNKNOWN: THE DETAILS

The economic analysis of law (sometimes referred to by the moniker “Law and Economics”), is considered by many to be the single most influential school of jurisprudential thought in the United States.<sup>28</sup> It is also the most prominent example of a seemingly omnipotent behavioral framework having its legs cut out from underneath it by subsequent findings.<sup>29</sup> Though economic analysis has become the punching bag *du jour* in many academic circles, in this section I argue that, contrary to popular belief, all is not lost, and I discuss how evolutionary psychology can help make good on the promises once tendered by the economic analysis movement.

The field of Law and Economics is so expansive that it would be a fool’s errand to attempt to craft a single mission statement to encapsulate it.<sup>30</sup> So instead, I will sidestep that undertaking and instead offer that Richard Posner—the field’s most prominent proponent—defines Law and Economics as the application of the methodologies of neoclassical economics to the study of legal rules.<sup>31</sup> The “methodologies of neoclassical economics” of

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28. See, e.g., Anthony T. Kronman, Address, *The Second Driker Forum for Excellence in the Law*, 42 WAYNE L. REV. 115, 160 (1995).

29. See, e.g., Herbert Hovenkamp, *Law and Economics in the United States: A Brief Historical Survey*, 19 CAMBRIDGE J. ECON. 331, 346–48 (1995); Jonathan Rowe, *It’s Time to Base Economics on Human Nature, Not Homo Economicus*, EVONOMICS, <http://evonomics.com/its-time-to-base-economics-on-human-nature/> (last visited Jan. 14, 2017).

30. See generally Hovenkamp, *supra* note 29.

31. See *id.* at 332.



course includes a voluminous set of tools, but I would like to focus on two in particular here, because it is the combination of these two components from which the Law and Economics framework derives much of its power. The first is the rationality assumption of human behavior. Traditional economic analysis, and, in turn, traditional economic analysis of law, starts with the assumption that human beings are rational—meaning that they act in such a way as to maximize their own well-being.<sup>32</sup> Generally speaking, this assumes that people prefer more happiness to less, two dollars to one, a more favorable probability to a less favorable probability, and that they make decisions that are consistent with these preferences.

The second component is the analytical framework of game theory. Generally, game theory uses sophisticated models of cost-benefit analysis, including concepts such as “expected utility” (the calculation of the probability of an event occurring multiplied by net potential costs and benefits associated with that event) and “Nash equilibrium” (the calculation of the best possible decision given the best possible decisions of others) to run complex decision-making simulations and predict optimal courses of action.<sup>33</sup>

By combining these two components—that is, by merging the rationality assumption of human behavior with the analytical framework of game theory, scholars were equipped with an incredibly powerful set of deductive tools, able to generate predictive models of behavior for an apparently limitless set of circumstances. Simply set the parameters of the game to conform to situation at hand—whether a litigant should accept a settlement offer, whether a party to a contract should breach, or whether the owner of a well should erect a barrier around it, for instance—then assume rational behavior for all persons involved, and run the simulation. The potency of this framework for policymakers should be immediately apparent. With the ability to explain and predict how people will behave in any given circumstance, the law is in a better position to install mechanisms to influence it. Meaning, by honing in on the reasons that people act the way they do, and by constructing more accurate predictive models of what they will do and when, the law can more effectively and more efficiently utilize the many incentives at its disposal (e.g., tax breaks, prison sentences) to encourage socially-desirable behavior and discourage the alternative.

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32. See Richard A. Posner, *Rational Choice, Behavioral Economics, and the Law*, 50 STAN. L. REV. 1551, 1551 (1998).

33. See ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 34–38 (3d ed. 2000) (for an overview of the use of game theory in the economic analysis of law).

And this form of analysis did prove potent indeed. It allowed scholars to explain and predict (and suggest methods for influencing) behavior across nearly every facet of law, including intellectual property, criminal law, administrative law, employment law, family law, property law, torts, and environmental law, to name a few, and turned Law and Economics into the seemingly unstoppable juggernaut of analysis that would come to dominate the legal academy in the years to come.<sup>34</sup>

But Law and Economics was eventually stopped, or at least slowed and blunted, by the rapid ascension of another discipline: “Behavioral Economics.”<sup>35</sup> Behavioral Economics challenged the behavioral model proffered by Law and Economics by championing the singular core tenet that human beings are simply not rational.<sup>36</sup> Using a wealth of experimental data to support their claims, Behavioral Economists convincingly demonstrated that actual human behavior often deviates from the predictions generated by the traditional economic model; we have inconsistent preferences, flawed memories, faulty probabilistic calculators, and scores of other ‘heuristics and biases’ that prevent us from making optimal decisions in every context.<sup>37</sup> Today, as a result of these findings, in all but the most obstinate of circles, scholars acknowledge that the rationality assumption of behavior is, at best, inaccurate, and, at worst, so flawed as to be beyond practicable use.<sup>38</sup>

By weakening the underlying model of behavior, Behavioral Economics stripped Law and Economics of much of its theoretical power and academic clout.<sup>39</sup> But while the rationality assumption of human behavior, one pillar of the Law and Economics framework, has been significantly weakened, the other pillar, the game theoretical framework of analysis, remains as powerful and useful as ever. It merely requires a more coherent model of human behavior—a model that enables accurate prediction under novel circumstances—in order to thrive.<sup>40</sup> Evolutionary psychology has the potential to restore the promise of the Law and Economics by replacing

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34. *See generally id.*; RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* (9th ed., 2014).

35. For a classic article on the subject, see Christine Jolls, Cass R. Sunstein & Richard Thaler, *A Behavioral Approach to Law and Economics*, 50 *STAN. L. REV.* 1471 (1998).

36. *Id.* at 1477–79 (discussing the various ‘bounds’ of rationality).

37. *See generally* Jolls, Sunstein & Thaler, *supra* note 35 (provides an analysis of many heuristics and biases that prevent human behavior from consistently being rational).

38. For a useful overview of the state of both Law and Economics and Behavioral Law and Economics, see Owen D. Jones, *Why Behavioral Economics Isn’t Better, and How It Could Be* (Vand. Law & Econ., Working Paper No. 14-30, 2014), <https://ssrn.com/abstract=2504776>.

39. *See id.* at 5–7.

40. *See generally* ROBERT COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 34–37 (6th ed. 2016).

“rational” with a more realistic template of behavior that nonetheless retains the predictive capacity of traditional economic analysis.<sup>41</sup> Like traditional economic theory, evolutionary theory also posits that humans are built to maximize, or at least optimize, welfare. But instead of the long term individual welfare contemplated by the rational-choice model, evolutionary psychology envisions a different kind of welfare maximization—a gene-centric, ecologically rational kind that accounts for the process (i.e., natural selection) responsible for the design of the system.<sup>42</sup>

The first step of an evolutionary psychological investigation into human behavior is rooted, not in the traditional methods of economics or even psychology, but rather in the forensic techniques of history and anthropology.<sup>43</sup> In this view, understanding the various psychological processes of the mind starts with understanding how they got there, which means that, rather than working inductively from contemporary behavioral observations, we instead look to the statistical composite of the social, biological and physical conditions of the environment in our psychological processes were forged.<sup>44</sup> Because evolution happens incrementally over extremely-long time courses, and because human beings have existed as hunter-gatherers for nearly all of our existence, this entails investigating the various recurrent challenges of the hunter-gatherer milieu.<sup>45</sup> By identifying these different challenges—things like avoiding predators, hunting and foraging for food, joining and recruiting coalitions, selecting a good mate, maintaining a favorable reputation, learning a language, cooperating with others in joint ventures, avoiding exploitation, or protecting offspring from harm—we can begin to form hypotheses about the different psychological systems that were selected to navigate the challenges.<sup>46</sup>

But identifying the function—the system or engineering goal—of a particular psychological program is only part of the work. This function does not just emanate from the brain; it is made possible by mechanisms embedded in neural tissue.<sup>47</sup> Therefore, truly understanding how a particular

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41. Jones, *Useful Sources*, *supra* note 25, at 14–22.

42. *Id.* at 14–19.

43. John Tooby & Irvén DeVore, *The Reconstruction of Hominid Behavioral Evolution Through Strategic Modeling*, in *THE EVOLUTION OF HUMAN BEHAVIOR: PRIMATE MODELS* 183, 183–237 (Warren G. Kinzey ed., 1987).

44. *Id.* at 194.

45. *Id.* at 204–07.

46. *See generally id.* at 200–02.

47. John Tooby & Leda Cosmides, *Toward Mapping the Evolved Functional Organization of Mind and Brain*, in *THE NEW COGNITIVE NEUROSCIENCES* 1167, 1167–68 (Michael S. Gazzaniga ed., 2d ed. 2000).

psychological program works requires identifying the information-processing machinery that was selected to carry out its particular task. This, in turn, requires identifying at least three components of that machinery: the information from the environment that the program uses as input, the internal decision-rules or algorithms that process that input, and the cognitive and behavioral features generated as outputs by the algorithm.<sup>48</sup> The precise inputs, algorithms, and outputs for any given psychological process vary from others, and require persistent experimentation to identify, but by identifying the function of a particular psychological system, we have narrowed the unwieldy list of potential components and given ourselves a head start in investigation.<sup>49</sup>

As an example, consider the recent study conducted by the evolutionary psychologist Michael Bang Petersen and colleagues, which sought to illuminate modern criminal justice systems by investigating the evolved mechanisms regulating decisions about whether to punish or forgive an offender following a transgression.<sup>50</sup> In this study, they proposed a system that took into account the fact that, in the ancestral milieu, the long-term fitness benefits of retaining a transgressor as a coalitional ally could sometimes outweigh the benefits of punishment.<sup>51</sup> Channeled by that hypothesis, they tested and found evidence for an information processing model that, following an offense: (1) takes as input cues such as the formidability, familial relationship, and productivity of the transgressor (2) uses those inputs to compute an index representing the individual's value as a long term associate, and (3) uses this index to generate output in the form of a decision of whether or not to punish or forgive the transgressor.<sup>52</sup> By using a functional approach, Petersen and colleagues were able to take the decision of "punish or repair" and begin to deconstruct that decision down to its individual information-processing components.<sup>53</sup>

Again, it is not that an evolutionary point of view—neither here, nor in general—provides researchers with all of the specific details of what might constitute an input, algorithm, or output for any given psychological process. An evolutionary point of view merely gives researchers a head start by

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48. *See id.* at 1168.

49. *Id.* at 1175–76.

50. Michael Bang Petersen, Aaron Sell, John Tooby & Leda Cosmides, *To Punish or Repair? Evolutionary Psychology and Lay Intuitions About Modern Criminal Justice*, 33 *EVOLUTION & HUM. BEHAV.* 682, 682 (2012).

51. *Id.* at 689–90.

52. *Id.* at 693–94.

53. *Id.* at 682–95.

narrowing the list of possible alternatives with a theoretically-sound predictive model. Researchers have successfully used this technique to verify predictions and produce working computational models for a range of psychological processes, from basic systems for vision and language acquisition, to emotions such as disgust and anger, and even moral judgments such as in the example above.<sup>54</sup> But, again, while scholars are in possession of a template of investigation, most of the work remains undone; the multitude of human psychology is stretched out in front of researchers as a ‘known unknown.’

In time, this method for investigation will become less of a research heuristic and more and more of a rigorous computational schematic: a system for tracking exactly how information from the environment is filtered, represented, cataloged, and synthesized by the brain and transformed into the thoughts, feelings, physiology and behaviors that comprise the human experience. And with these schematics in hand, scholars and policymakers then have the type of tool once envisioned by the Law and Economics movement: a coherent theoretical lodestar that can be used to predict and explain behavior across a range of contexts.

### III. THE UNKNOWN UNKNOWN: INSTINCT BLINDNESS

To truly understand the long term value of evolutionary psychology for the law, we must double back on a point made at the beginning of this Article: most of what goes on in the human mind happens outside of consciousness; humans simply have no introspective access to the bulk of processing that goes on in the brain. In many cases, both the information being used as input by the various processes in the brain, as well as the algorithms and decision rules that are synthesizing those inputs, operate wholly out of view, depositing only the output—the thought, feeling, decision, motivation, or judgment—into the part of the brain that we have conscious access to.<sup>55</sup> Because mental processing is often not just unconscious, but also automatic and effortless, this creates a state of affairs that the evolutionary psychologists John Tooby and Leda Cosmides refer to as “instinct blindness.”<sup>56</sup>

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54. *Id.* at 693–94.

55. Leda Cosmides & John Tooby, *Beyond Intuition and Instinct Blindness: Toward an Evolutionarily Rigorous Cognitive Science*, 50 *COGNITION* 41, 65–74 (1994).

56. *Id.* (introducing the concept of instinct blindness and discussing the problems it creates for understanding psychology).

Instinct blindness reflects the human tendency to not only take for granted the processes by which our instincts are generated, but also the tendency to defer to those instincts, to accept them as reflective of some higher truth, or desirable state of affairs.<sup>57</sup> And nowhere is this phenomenon more prevalent than within the law, where courts and lawmakers consistently defer to intuitions about what “feels” just or unjust, offensive or inoffensive, right or wrong, natural or unnatural, without bothering to examine how or why those intuitions are generated in the manner that they are. The punishment for intentional homicides, for example, is mitigated when the killer acts “under the influence of passion or in the heat of blood”;<sup>58</sup> punishment is considered cruel and unusual when it contravenes “evolving standards of decency that mark the progress of a maturing society”;<sup>59</sup> and despite the fact that offensive speech may be considered “indefinable,” most of us, Justice Stewart included, have no problem also confessing that “I know it when I see it . . . .”<sup>60</sup> Notice that each of these standards (to a greater or lesser degree) is largely content free: the standard simply references an intuitive conception—of passion, decency, or offensiveness—without specifying an objective definition, thereby leaving it to the individual judge or juror to supply their own intuitional formation (e.g., what is considered “offensive” is that which offends).

By the same token, many of the jurisprudential debates that surround these standards revolve around concepts such as history and tradition or contemporary community standards. More specifically, the idea that there is a history and tradition of prohibiting (or not protecting) a certain practice, or that a particular article contravenes contemporary community standards of offensiveness, is often used as justification for continued prohibition.<sup>61</sup> But

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57. *See id.* at 66.

58. *Maier v. People*, 10 Mich. 212, 218–19 (1862) (“[I]f the act of killing, though intentional, be committed under the influence of passion or in the heat of blood . . . and is the result of the temporary excitement, by which the control of reason was disturbed, rather than of any wickedness of heart or cruelty or recklessness of disposition . . .”).

59. *Trop v. Dulles*, 356 U.S. 86, 100–01 (1958) (“[T]he words of the Amendment are not precise, and . . . their scope is not static. The Amendment must draw its meaning from the evolving standards of decency that mark the progress of a maturing society.”).

60. *Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring) (“I shall not today attempt to further define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligibly doing so. But I know it when I see it, and the motion picture involved in this case is not that.”).

61. *See, e.g., Obergefell v. Hodges*, 135 S. Ct. 2584, 2598 (2015) (“The identification and protection of fundamental rights is an enduring part of the judicial duty to interpret the Constitution. . . . History and tradition guide and discipline this inquiry but do not set its outer boundaries.”) (citations omitted); *Miller v. California*, 413 U.S. 15, 24 (1973) (“The basic



relying on concepts such as history and tradition or contemporary community standards is logically tantamount to deferring to our intuitions simply because people have had these intuitions for a long time, or because the majority of people share these intuitions now. The problem with this aggregation and repackaging of individual intuitions is that they are statistical observations, not value judgments. It only tells us of their age and number, but not anything of their underlying usefulness outside of the fact that they might be old and widespread. An apt analogy can be found in the collateralized debt obligations (CDO) responsible for the subprime mortgage crises of the late 2000s.<sup>62</sup> By aggregating and repackaging individual mortgages, issuers only increased the perception of their underlying value—if the underlying mortgages were faulty, aggregating them did not help; issuers simply created a package of many small slices of bad mortgages. The same is true here: if the intuition is otherwise flawed in some manner, that flaw is not erased by the fact that humans have had these instincts over long time courses, or that a large number of people share them today.

Which, of course, begs the question: are our instincts and intuitions flawed? The answer to which turns on a second question, which is: flawed for what? Our instincts are not paragons of a higher moral truth, or proclamations sent down to us from the heavens, but instead are physical processes embedded in neural tissue, the outputs of which emanate from information-processing systems selected because they helped us, in some way, survive and reproduce in the environment of our ancestors. In this sense, they were well enough suited for their respective functions to survive thousands of generations of evolution, which is no small feat. But that does not mean that they are perfectly accurate, reliable, or virtuous, or that they should, *a priori*, be used as benchmarks in shaping our day-to-day lives.

This is especially obvious in some domains, such as physics or biology, where scientific progress has so vastly eclipsed our common-sense instincts that deference to our intuitions would be considered absurd.<sup>63</sup> Our intuitive theories about the sources and operation of life (e.g., vitalism, essentialism, creationism) or of the rules governing the states and movement of objects (e.g., rules based on impetus or absolute movement and motionlessness), for

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guidelines for the trier of fact must be: (a) whether the ‘average person, applying contemporary community standards’ would find that the work, taken as a whole, appeals to the prurient interest.”) (citation omitted).

62. Eamonn K. Moran, *Wall Street Meets Main Street: Understanding the Financial Crisis*, 13 N.C. BANKING INST. 5, 39 (2009).

63. See Steven Pinker, *The Cognitive Niche: Coevolution of Intelligence, Sociality, and Language*, 107 PROC. NAT’L ACAD. SCI. 8993, 8993 (2010).

example, were useful enough to navigate the social and physical environment of our ancestors, but are, at best, only metaphorically-accurate abstractions of a reality that includes evolution, population genetics, mechanistic physiology, Newtonian mechanics, relativity, and quantum theory.<sup>64</sup>

The phenomenon may be less obvious in the realm of psychology, where the modern sciences of the mind are, relative to disciplines such as physics or biology, still in their infancy. And yet it seems a safe bet that just as our common sense instincts indicate that the world is flat, motionless, and at the center of a revolving universe, there are undoubtedly a host of legally-relevant psychological intuitions—moral judgments; conceptions of right and wrong; intuitions of fairness and of justice; retribution; desert; proportionality; or offensiveness—that we cherish or value today, that, one day, will be illuminated in such a way that our understanding of them changes and perhaps our reverence for them is diminished. And just as it has done in so many other domains, an evolutionary approach to the human mind will play a central role in turning these instinctual “mysteries” into “problems.” Using a functional perspective to reverse engineer our intuitions into their individual computational elements, researchers and legal scholars will be able to answer both why we have the instincts we do (i.e., what causal role they played in the survival and reproduction of our ancestors), as well as how they work (i.e., what information is being extracted from the environment, what decision-rules and algorithms are governing the processing of that information, and how is that computation translated into the various “gut-feelings” we experience as output) and, as a result, hopefully render our instincts and intuitions less mysterious and more straightforwardly evaluated for their continued use in law and policy.

A final example should help to make these various ideas crystalline. Consider the human instinct of retributive justice—the intuition that an offender should be punished in a way that is proportional to the harm they have inflicted.<sup>65</sup> Whereas, for example, a traditional economic analysis of law would presume that, as rational punishers, we should favor a more utilitarian approach, such as optimal deterrence,<sup>66</sup> research has repeatedly demonstrated that, despite participants’ claims that they employ both utilitarian and retributive principles, (a) when faced with actual sentencing decisions, criminal punishment decisions are driven primarily by retribution, and (b)

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64. *Id.* at 8997.

65. See John Rawls, *Two Concepts of Rules*, 1 PHIL. REV. 3, 4–5 (1955).

66. See, e.g., Richard A. Posner, *An Economic Theory of Criminal Law*, 85 COLUM. L. REV. 1193, 1205–14 (1985).

these retributive judgments persist even when participants are unable to explicitly justify the reasons for these decisions.<sup>67</sup> In other words, we are retributivists at heart, even if we cannot explain it.

But should the continued use of the retributive framework rest on an explanation that goes no deeper than a collective gut feeling? Should we not at least inquire as to why we are instinctive retributivists, and as to how the brain makes such retributive calculations? Assuming the answer is yes, an evolutionary approach would counsel starting with the function that retributive intuitions would have served in the ancestral environment, and from there investigating the information-processing structure of the neural pathways that execute this function.

One promising hypothesis is that the adaptive function of retribution is to “reckon justice and administer punishment by a calculus which ensures that violators reap no advantage from their misdeeds.”<sup>68</sup> In other words, the retributive instinct is meant to set punishment at a level that balances effort with efficaciousness by reducing the profitability of bad acts to zero.<sup>69</sup> This, in theory, serves as both a specific deterrent to the offender, as well as a general deterrent to others considering similar bad acts, the logic being that if they know they are unlikely to reap a profit, they will refrain from taking on the risk and expending the effort required to accomplish the bad act.

While this calculus appears to operate on a very minimal information-processing heuristic—the input used is simply the amount of harm inflicted, the algorithm sets the output equal to the input, and then the output is generated in the form of the intuition for “justice”—tangential research shows that this baseline calculus is not absolute, and can be influenced by several factors. For example, the research of Michael Bang Petersen discussed above illustrates that an individual’s value as a long-term associate can also be incorporated as input into decision-rules governing punishment.<sup>70</sup> Other research corroborates this effect, demonstrating that punishment intuitions for transgressions vary as a function of the social category of the interactants (i.e., family, friend, or stranger).<sup>71</sup> Thus, while “an eye for an eye” may be used as an algorithmic starting point, it appears that this starting point may be oscillated by other evolutionary-salient factors as well.

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67. See Eyal Aharoni & Alan J. Fridlund, *Punishment Without Reason: Isolating Retribution in Lay Punishment of Criminal Offenders*, 18 PSYCHOL. PUB. POL’Y & L. 599 (2012) (for a review of the literature and empirical confirmation of the mentioned phenomena).

68. MARTIN DALY & MARGO WILSON, HOMICIDE 256 (1988).

69. *Id.*

70. Petersen, Sell, Tooby & Cosmides, *supra* note 50, at 687.

71. See Debra Lieberman & Lance Linke, *The Effect of Social Category on Third Party Punishment*, 5 EVOLUTIONARY PSYCHOL. 289, 290 (2007).

The overall points to be gleaned are these: (1) we know that our retributive instincts are natural phenomena selected for the proximate role they played in humans' reproductive success in ancestral environments; (2) it appears, based on available theory and research, that this role was to serve as a formula for punishment that incorporates an underlying deterrent objective with other pragmatic concerns for biological success (i.e., retaining a valuable ally or helping genetic kin); and (3) while the hypothesized function of retributive intuition seems to be on solid ground, researchers are still in the process of defining the precise computational mechanics at play.

In other words, our retributive instinct falls somewhere in the middle of Rumsfeld's spectrum of knowledge. It is no longer an unknown unknown, but instead sits in a transitional phase, caught between being a known unknown and a known known. Where once there was only the "feeling" of retribution, there is now a coherent explanation for its function, and a working, incomplete schematic of its cognitive operation. Though there is work to be done, the legal community is nonetheless better equipped to evaluate the phenomenon from a normative point of view. Are the evolutionarily-salient inputs (a rough heuristic for deterrence, coalitional value, etc.) instantiated in these instincts ones in which we wish to privilege in our contemporary legal intuitions? If not, is the psychological satisfaction, both for individual victims and society at large, reason enough to retain retributivism in legal policy? I have no immediate opinion, though I do maintain that these are the questions we should be asking, and an evolutionary analysis allows us to approach them with greater clarity.

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