EVOLUTIONARY ANALYSIS IN LAW: On Disclosure Regulation

Michael D. Guttentag*

This article, a contribution to a symposium celebrating the twentieth anniversary of the Society for Evolutionary Analysis in Law, applies evolutionary analysis to the study of disclosure regulation. I consider how an evolutionary perspective can improve our understanding of when and how to use disclosure requirements to regulate social activity.

I. INTRODUCTION

Evolutionary analysis in law offers both promise and peril. The promise comes from its unique ability to answer "Why?" questions about human behavior. If we can explain why a behavior occurs, then it should be easier to predict and explore the contours and intensity of that behavior and, perhaps, better understand how to modify that behavior, if need be.[1] This is the promise of evolutionary analysis in law.

There are, however, challenges that arise when trying to apply evolutionary analysis to human behavior. Perhaps the most obvious challenge comes from the fact that researchers pursuing evolutionary analysis are necessarily dependent to some degree on what might appear to be "just so" stories.[2] In exploring links between human behavior and evolutionary analysis, researchers must turn to historical narratives because there is very little physical evidence remaining about the challenges that shaped human behavior over thousands of generations. Additional complications arise from

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* Professor of Law and John T. Gurash Fellow of Corporate Law and Business, Loyola Law School, Los Angeles. I would like to thank for helpful comments and feedback David Hyman, Owen D. Jones, Robin Kar, Deborah Lieberman, Steven L. Neuberg, Carlton J. Patrick, Lee Petherbridge, Allison Quaglino, Michael Sacks, and especially Keelah Williams, and participants at the Society for Evolutionary Analysis in Law 2016 Conference.

1. *See, e.g.*, Owen D. Jones, *Time-Shifted Rationality and the Law of Law's Leverage*, 95 NW. U. L. REV. 1141, 1143 (2001) ("[I]t seems not only probable but inevitable that behavioral biology can offer something constructive to the interdisciplinary effort to understand and predict human irrationality in ways useful to law.").

2. RUDYARD KIPLING, JUST SO STORIES (1902). For discussions that directly address this point, see Jones, *supra* note 1, at 1199–1201, and Robert Kurzban, *Grand Challenges of Evolutionary Psychology*, 1 FRONTIERS PSYCHOL. 1 (2010).

the fact that human behavioral predispositions[3] likely coevolved with cultural practices[4] and were produced to some degree by group selection.[5] These complex evolutionary processes further complicate the determination of which specific behavioral predispositions might have contributed to inclusive fitness over time.[6] This is why it can be a perilous endeavor to describe how our behavioral predispositions were shaped by evolutionary processes.

Additional challenges arise when applying evolutionary analysis to questions involving the law. Developing sound legal policy typically requires considering a wide variety of trade-offs, including questions of both efficiency and fairness. It is not obvious when understanding the ultimate causes of human behavior will significantly advance this process. In many situations, it may be sufficient just to identify the proximate details of human behavior to carry out policy analysis.

Given these challenges—a limited historical record, complicated evolutionary dynamics, and the uncertain incremental value of understanding ultimate causation—it should come as no surprise that legal scholars in carrying out evolutionary analysis in law often tend toward "hugging the shore."[7] By this I mean that scholars interested in the application of evolutionary analysis in law generally choose to focus on issues where the legal system engages behaviors that are highly salient from an inclusive fitness perspective, such as rape and infanticide.[8]

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3. Professors Owen Jones and Timothy Goldsmith offer the following explanation of what constitutes a behavioral predisposition and why it might be produced by natural selection:

> By "a predisposition" we refer to a psychological trait that is a heritable and behavior-biasing algorithm manifested in the brain's neural architecture. For a behavioral predisposition to be "adaptive," it must have conferred greater reproductive success on individuals that bore it than did any other contemporaneously existing alternatives exhibited by other individuals within the population—and, thus, have been maintained by natural selection.

Owen D. Jones & Timothy H. Goldsmith, *Law and Behavioral Biology*, 105 COLUM. L. REV. 405, 461 n.170 (2005).

4. PETER J. RICHERSON & ROBERT BOYD, NOT BY GENES ALONE: HOW CULTURE TRANSFORMED HUMAN EVOLUTION 215–16 (2008).

5. ELLIOTT SOBER & DAVID SLOAN WILSON, UNTO OTHERS: THE EVOLUTION AND PSYCHOLOGY OF UNSELFISH BEHAVIOR 4 (1998).

6. *See, e.g.*, Amy L. Wax, *Evolution and the Bounds of Human Nature*, 23 LAW & PHIL. 527 (2004).

7. JOHN UPDIKE, HUGGING THE SHORE: ESSAYS AND CRITICISM (1983).

8. *See, e.g.*, Owen D. Jones, *Evolutionary Analysis in Law: An Introduction and Application to Child Abuse*, 75 N.C. L. REV. 1117 (1997) [hereinafter Jones, *An Application to Child Abuse*]; Owen D. Jones, *Sex, Culture, and the Biology of Rape: Toward Explanation and Prevention*, 87 CALIF. L. REV. 827 (1999) [hereinafter Jones, *Sex, Culture, and the Biology of*

In contrast, this article considers an application of evolutionary analysis in law that reaches out a bit farther from the shore. I consider here the potential applicability of evolutionary analysis in law to practices that have a less obvious link to inclusive fitness concerns: using disclosure requirements to regulate social activity. It is easy to imagine how to lampoon the topic of this article. Consider the following cartoon: there is a caveman facing off against a sabretooth tiger. He pauses, and looks to the side of the tiger to read the instruction manual attached. It says: "Warning: This tiger may eat you while you attempt to read these instructions." Tiger: one; disclosure regulation: zero.

But the analysis here suggests that the opposite may actually be true. Evolutionary analysis in law proves to be quite helpful in improving our understanding of a practice as seemingly modern, administrative, and bureaucratic as any: disclosure regulation. Introducing an evolutionary perspective can fill in large gaps in our understanding of disclosure regulation created by the nearly complete failure thus far to address "Why?" questions about the effects of disclosure requirements. Until we incorporate insights from evolutionary analysis, our understanding of when and how to use disclosure rules to regulate social activity will remain fragmented and incomplete.

This article proceeds as follows. In Section II, I provide a brief introduction to evolutionary analysis generally and evolutionary analysis in law, in particular. In Section III, I offer an overview of the current state of disclosure regulation. In Section IV, I show how and why to draw connections between these two seemingly disparate areas of research.

II. THE PROMISE OF EVOLUTIONARY ANALYSIS IN LAW

A. Evolutionary Analysis

The central claim of evolutionary analysis is that all attributes of living beings are produced by natural processes. As Charles Darwin observes:

Rape]. *But see* Michael D. Guttentag, *Is There a Law Instinct?*, 87 WASH. U. L. REV. 269 (2009); Robin Bradley Kar, *The Deep Structure of Law and Morality*, 84 TEX. L. REV. 877 (2006); Robin Bradley Kar, *The Psychological Foundations of Human Rights*, *in* OXFORD HANDBOOK OF INTERNATIONAL HUMAN RIGHTS LAW 104 (Dinah Shelton ed., 2013); Robin Bradley Kar, *The Two Faces of Morality: How Evolutionary Theory Can Both Vindicate and Debunk Morality (with a Special Nod to the Growing Importance of Law)*, *in* EVOLUTION AND MORALITY: NOMOS LII 31 (James E. Fleming & Sanford Levinson eds., 2012).

> When we no longer look at an organic being as a savage looks at a ship, as at something wholly beyond his comprehension; when we regard every production of nature as one which has had a history; when we contemplate every complex structure and instinct as the summing up of many contrivances, each useful to the possessor, nearly in the same way as when we look at any great mechanical invention as the summing up of the labour, the experience, the reason, and even the blunders of numerous workmen; when we thus view each organic being, how far more interesting, I speak from experience, will the study of natural history become![9]

Understanding and analyzing evolutionary processes requires a different set of analytic tools than those relied upon to carry out scientific investigation in the "traditional" physical sciences. These epistemological differences can be a source of confusion for those accustomed to the more "traditional" areas of scientific research. Biologist Ernest Mayr, for one, suspects that much of the dissatisfaction with evolutionary analysis comes from failing to distinguish the methodology of biology from the methodology of physical sciences. Mayr observes: "The classical physical sciences, on which the classical philosophy of science was based, were dominated by a set of ideas inappropriate to the study of organisms: these included essentialism, determinism, universalism, and reductionism. Biology, properly understood, comprises population thinking, probability, chance, pluralism, emergence, and historical narratives."[10]

Because of these epistemological differences, the types of questions one addresses in considering evolutionary processes are different than in the classical physical sciences. In carrying out the evolutionary analysis of biological phenomena, there are two distinct kinds of questions one must ask and answer: how questions and why questions.[11] As Mayr observes:

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9. CHARLES DARWIN, ON THE ORIGIN OF SPECIES 422 (1859). In a similar vein, Jones and Goldsmith observe: "Natural selection is the one process that can lead to increases in complexity and can produce the fit between the features of an organism and its environment." Jones & Goldsmith, *supra* note 3, at 429.

10. ERNST MAYR, THIS IS BIOLOGY: THE SCIENCE OF THE LIVING WORLD, at xvii (1997) [hereinafter MAYR, THIS IS BIOLOGY]. In another writing, Mayr makes a similar observation, Ernst Mayr, *Cause and Effect in Biology*, 134 SCI. 1501, 1506 (1961) ("Causality in biology is a far cry from causality in classical mechanics.").

One example of the failure to distinguish between the methods of classical physics and of biology that Mayr describes involves misperceptions about the role of the experiment. "The experiment was so valuable in [the classical physical sciences] that eventually it came to be treated as if it were the *only* valid scientific method." MAYR, THIS IS BIOLOGY, *supra*, at 28.

11. Mayr observes that "no biological phenomenon is fully explained until both proximate and ultimate causations are illuminated." MAYR, THIS IS BIOLOGY, *supra* note 10, at 118; *see also*

> Every phenomenon or process in living organisms is the result of two separate causations, usually referred to as proximate (functional) causations and ultimate (evolutionary) causations. . . . Ultimate or evolutionary causations are those that lead to the origin of new genetic programs or to modification of existing ones . . . They are the past events or processes that changed the genotype. They cannot be investigated by the methods of chemistry or physics but must be reconstructed by historical inferences—by the testing of historical narratives. They are usually the answer to "Why?" questions.[12]

The idea that human behavior, as well as human physiology and animal behavior, is a product of and therefore necessarily understood in the context of the dynamics of natural selection has a lineage that goes back to Darwin. In *On the Origin of Species*, Darwin wrote: "In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history."[13] Darwin's prediction appears to be coming to fruition. Several developments have brought increased attention to and focus on the application of evolutionary analysis to human behavior. For example, in 1975, perhaps a bit too brazenly, Professor Edward O. Wilson included in his textbook, *Sociobiology: The New Synthesis*, a final chapter on how evolution might inform our understanding of human social behavior.[14]

More recently, a number of psychologists have offered detailed accounts as to what an evolutionary theory of human psychology might look like, and how this research approach can contribute to our understanding of human behavior generally. Carlton Patrick, a legal scholar, nicely summarizes the current state of the endeavor as follows:

> Evolutionary psychology is an approach to understanding the human mind that integrates principles from biology, anthropology, and the cognitive sciences into a holistic account of human nature.

Owen D. Jones, *Evolutionary Psychology and the Law*, *in* THE HANDBOOK OF EVOLUTIONARY PSYCHOLOGY 953 (David M. Buss ed., 2005); Jones & Goldsmith, *supra* note 3, at 455.

12. MAYR, THIS IS BIOLOGY, *supra* note 10, at 67. Mayr also notes: "Very few people realize that it was Darwin who was responsible for making 'Why?' questions scientifically legitimate." *Id.* at 116.

13. DARWIN, *supra* note 9, at 424.

14. EDWARD O. WILSON, SOCIOBIOLOGY: THE NEW SYNTHESIS 547 (1975). This chapter was widely attacked by an academy that was accustomed to thinking of human behavior as exclusively a product of cultural and political phenomena, as discussed in MAYR, THIS IS BIOLOGY, *supra* note 100, at 203.

> It rests on the assumption that the human mind, like the rest of the human body, was forged through natural selection. . . . By investigating the ancestral problems the brain evolved to solve, we can begin to identify the functional units within the brain that were selected to accomplish these tasks and, subsequently, investigate their design.[15]

Psychologists Jon Maner and Douglas Kenrick observe that this evolutionarily informed approach to understanding human behavior can provide "a deeper explanatory framework that helps explain psychological phenomenon in terms of their root causes."[16]

One implication of findings from evolutionary psychology is that people are unlikely to respond to new information in the same way regardless of the context or manner in which the information is provided. Evolutionary psychology suggests, instead, that human behavior is characterized at some level by specific or modular capabilities, and, therefore, that a change in context may alter which particular capabilities are triggered.[17] As Maner and Kenrick observe, "a view of the mind as domain specific implies that psychological mechanisms that govern cognition and behavior in one social domain may be very different from those that govern cognition and behavior in other social domains."[18]

Economic experiments bear out the prediction from evolutionary psychology that much human behavior, including how new information is processed, is highly sensitive to context.[19] In economic experiments, researchers consistently find that small changes in experimental details have unexpected effects on the behavior being studied ("framing effects").[20] For

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15. Carlton J. Patrick, *A New Synthesis for Law and Emotions: Insights from the Behavioral Sciences*, 47 ARIZ. ST. L.J. 1239, 1251–52 (2015). An alternative definition of evolutionary psychology is offered in Jon K. Maner & Douglas T. Kenrick, *Evolutionary Social Psychology*, *in* ADVANCED SOCIAL PSYCHOLOGY: THE STATE OF SCIENCE 613 (Roy F. Baumeister & Eli J. Finkel eds., 6th ed. 2010) (describing evolutionary social psychology as "an approach in which psychologists use what they know about human biological evolution to inform their understanding of the contemporary human mind").

16. Maner & Kenrick, *supra* note 155, at 615.

17. *See generally id.* (asserting that triggers for actions lie in social contexts).

18. *Id.* at 620 (citations omitted). For a discussion of the modularity of the mind more generally, see H. Clark Barrett & Robert Kurzban, *Modularity in Cognition: Framing the Debate*, 113 PSYCHOL. REV. 628 (2006).

19. *See generally* COLIN F. CAMERER, BEHAVIORAL GAME THEORY: EXPERIMENTS IN STRATEGIC INTERACTION (2003) (reviewing how economic experiments are carried out and summarizing findings from various types of economic experiments).

20. For example, one survey of thirty years of economic experiments identified the wording of instructions as one of the most important factors in explaining variations in the level of

example, there is evidence people in economic experiments are highly sensitive to context in deciding whether and to what extent to behave in an altruistic manner.[21] Similarly, subjects in economic experiments will assign more value to a given object simply because it is initially placed in their possession ("endowment effects").[22]

This sensitivity to context is not only difficult to explain as the product of rational calculation, but also presents a challenge to those attempting to describe human behavior in terms of broad categories.[23] It is difficult, for example, to say that people are generally altruistic when the willingness to act in an altruistic manner proves to be contingent on a number of seemingly irrelevant and arbitrary contextual factors.

An alternative approach to describing human behavior, one suggested by evolutionary analysis, is to organize our analysis of human behavior based on specific challenges humans faced over the period during which behavioral predispositions evolved and matured.[24] The advantage of this more context-specific description of human behavior is that behavior within a specific domain is more likely to be consistent and predictable. One example of this more "modular" approach is provided by the work of Maner and Kenrick. They separate out "cognitive and behavioral mechanisms" into capacities to deal with five specific aspects of social life especially important from an

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normative behavior observed. David Sally, *Conversation and Cooperation in Social Dilemmas: A Meta-Analysis of Experiments from 1958 to 1992*, 7 RATIONALITY & SOC'Y 58, 78 (1995).

21. *See, e.g.*, John O. Ledyard, *Public Goods: A Survey of Experimental Research*, *in* THE HANDBOOK OF EXPERIMENTAL ECONOMICS 111, 156–58 (John H. Kagel & Alvin E. Roth eds., 1995); *cf.* Jennifer Arlen, *Comment: The Future of Behavioral Economic Analysis of Law*, 51 VAND. L. REV. 1765, 1786 (1998) ("Evidence suggests that people do not always require 'fair' outcomes, however. Some people may require 'fairness' only in some situations; other people may not care about fairness at all. Moreover, evidence suggests that the context of the decision and the surrounding norms may significantly affect the degree to which fairness concerns play a role.").

22. *See, e.g.*, Charles R. Plott & Kathryn Zeiler, *The Willingness to Pay-Willingness to Accept Gap, the 'Endowment Effect,' Subject Misconceptions, and Experimental Procedures for Eliciting Valuations*, 95 AM. ECON. REV. 530 (2005); Charles R. Plott & Kathryn Zeiler, *Exchange Asymmetries Incorrectly Interpreted as Evidence of Endowment Effect and Prospect Theory?*, 97 AM. ECON. REV. 1449 (2007); Charles R. Plott & Kathryn Zeiler, *The Willingness to Pay-Willingness to Accept Gap, the 'Endowment Effect,' Subject Misconceptions, and Experimental Procedures for Eliciting Valuations: Reply*, 101 AM. ECON. REV. 1012 (2011).

23. Arlen, *supra* note 21, at 1777 ("Behavioral economic analysis of law cannot serve as the basis for broad normative policy conclusions because it cannot provide a coherent alternative model of human behavior capable of generating testable predictions and policy conclusions in a wide range of areas.").

24. For a discussion of what constitutes a behavioral predisposition see *supra* note 3.

evolutionary perspective: "coalition formation, status, self-protection, mating, and parental care."[25]

B. Evolutionary Analysis in Law

Prescient scholars, most notably Professor Owen Jones, recognized that an evolutionary perspective could also enhance our understanding of legal systems.[26] Perhaps the most comprehensive exploration of the ways in which an evolutionary perspective might inform legal analysis is provided by an article in the *Columbia Law Review* that Jones co-authored with Professor Timothy Goldsmith, an expert on evolutionary biology.[27] In that article, *Law and Behavioral Biology*, Jones and Goldsmith explain how a biological

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25. Maner & Kenrick, *supra* note 155, at 621. Maner and Kenrick describe these aspects of social life challenges as follows: 1) coalition formation has to do with the task of cooperation among group members, a crucial skill for survival given that "cooperation among group members greatly increased each person's probability of surviving, prospering, and eventually reproducing," *id.* at 621 (citations omitted); 2) status involves the struggle to maintain high standing within a group so as to have "greater influence over others and greater access to group resources," *id.* at 623; 3) self-protection has an obvious inclusive fitness value in most situations, *id.* at 626–29; 4) mating is a fundamental human social challenge, because it is often the most direct means to increase one's inclusive fitness, *id.* at 629–34; and 5) raising offspring also provides a fairly direct means to increase one's inclusive fitness, *id.* at 634–36.

The typology of evolutionarily significant social tasks offered by Maner and Kenrick is by no means the only possible way of categorizing the different social challenges humans and other social animals might face over an evolutionarily significant period of time. An alternative system for organizing social behavior in terms of evolutionarily salient characteristics is offered by life history theory, which emphasizes the trade-offs between growth, maintenance, and reproduction, as briefly discussed in Keelah E. G. Williams, Oliver Sng & Steven L. Neuberg, *Ecology-Driven Stereotypes Override Race Stereotypes*, 113 PROC. NAT'L. ACAD. SCI., no. 2, 2016, at 310, http://www.pnas.org/content/113/2/310.full.pdf.

A third approach, separates the challenges species face into four types of struggles: 1) struggles with the natural conditions of life (including struggles with both other species and members of one's own species); 2) the struggle for mates (including the competition among males and females, and male and female mate choice); 3) conflicts within families; and 4) sexual conflict. David M. Buss, *The Great Struggles of Life*: *Darwin and the Emergence of Evolutionary Psychology*, 64 AM. PSYCHOLOGIST 140, 141–45 (2009)

26. *See, e.g.*, Jones, *An Application to Child Abuse*, *supra* note 8; Owen D. Jones, *Proprioception, Non-Law, and Biolegal History: The Dunwody Distinguished Lecture in Law*, 53 FLA. L. REV. 831 (2001); Jones, *Sex, Culture, and the Biology of Rape*, *supra* note 8; Owen D. Jones & Sarah F. Brosnan, *Law, Biology, and Property: A New Theory of the Endowment Effect*, 49 WM. & MARY L. REV. 1935 (2008); Jones, *supra* note 1; Paul H. Robinson, Robert Kurzban & Owen D. Jones, *The Origins of Shared Intuitions of Justice*, 60 VAND. L. REV. 1633 (2007).

27. Jones & Goldsmith, *supra* note 3. Other publications from Goldsmith include a leading textbook on evolution and human nature: TIMOTHY H. GOLDSMITH & WILLIAM F. ZIMMERMAN, BIOLOGY, EVOLUTION, AND HUMAN NATURE (2000).

perspective can improve the "behavioral models" on which many aspects of law are premised.[28] Jones and Goldsmith observe that "law's behavioral models are aligned in this: their nearly wholesale omission of life science perspectives on where behavior comes from, how it emerges, what processes give rise to its patterns, and how multiple causal influences will interact to affect it."[29] In a subsequent article Jones details how an evolutionary perspective can address this shortcoming, because "[t]here is no theoretical framework [other than evolutionary psychology] that explains the patterns of irrationalities [lumped under the umbrellas of bounded rationality and cognitive quirks], connects them together, and points in new directions."[30]

But there are also many challenges in attempting to successfully apply evolutionary analysis to legal policy questions.[31] For one thing, in many situations it may be sufficient to identify the proximate details of human behavior to carry out policy analysis. Jones recognizes that the extent to which incorporating an evolutionary perspective may advance our understanding of how to use law remains an open question, in part because so much of the terrain of law remains unexplored from the perspective of evolutionary theory. Jones observes: "there are probably many other law-relevant patterns that evolutionary analysis can help reveal."[32] In support of Jones' observation that much of the terrain involving evolutionary analysis of law remains unexplored, it is worth noting that this article is the first to explore links between disclosure regulation and evolutionary analysis.

III. THE CURRENT STATE OF DISCLOSURE REGULATION

The discussion in this Section considers: 1) the multitude of ways in which disclosure requirements are now used to regulate social activity, 2) the two dominant modes by which the efficacy of these disclosure requirements are analyzed (traditional economic analysis and behavioral economic analysis), and 3) evidence about if or when disclosure regulation is welfare-enhancing.

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28. Jones & Goldsmith, *supra* note 3, at 418; *see also* Jones, *supra* note 1, at 1204 ("Law deals in human behavior. The power of its models limits the power of law.").

29. Jones & Goldsmith, *supra* note 3, at 418 (footnote omitted).

30. Jones, *supra* note 11, at 1185.

31. *See supra* notes 2–6 and accompanying text.

32. Jones, *supra* note 11, at 1182.

A. Ubiquity of Disclosure Regulation

Disclosure regulation is now such a ubiquitous tool of the modern state that it is difficult to even provide a comprehensive listing of its numerous uses.[33] As Professors Omri Ben-Shahar and Carl E. Schneider observe in a book about disclosure regulation: "Mandated disclosures adorn food labels, travel tickets, leases, copyright warnings, time-share arrangements, house sales, store return policies, school enrollment and graduation data, college crime reports, flight-safety announcements, parking-garage stubs, product and environmental hazards, and car and home repairs."[34] One approach to identifying when and how disclosure regulation is used in our society is to catalogue the industries in which disclosure regulation is an essential component of the regulatory scheme. These industries include: health care

33. As George Loewenstein, Cass R. Sunstein & Russell Golman observed in a review of disclosure regulation: "Despite a paucity of data supporting the efficacy of such policies, information disclosure has been broadly advocated as an appropriate response to a wide range of social and economic problems." George Loewenstein, Cass R. Sunstein & Russell Golman, *Disclosure: Psychology Changes Everything*, 6 ANN. REV. ECON. 391, 392 (2014) (citation omitted).

In terms of the reasons for this ubiquity, Loewenstein, Sunstein & Golman offer the following explanation: "Given the potential benefits and the often low cost of information disclosure, it should come as no surprise that disclosure policies have proved highly attractive to legislators and regulators." *Id.* at 393 (citation omitted).

34. OMRI BEN-SHAHAR & CARL E. SCHNEIDER, MORE THAN YOU WANTED TO KNOW: THE FAILURE OF MANDATED DISCLOSURE 4 (2014).

services,[35] personal finance,[36] political spending,[37] real estate transactions,[38] and securities markets.[39]

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35. *See, e.g.*, *id.* ("Health law abounds in disclosures—in informed consent, drug labeling, research regulation, health insurance, living wills, and medical privacy."); William M. Sage, *Regulating Through Information: Disclosure Laws and American Health Care*, 99 COLUM. L. REV. 1701, 1825 (1999) ("Laws mandating disclosure of information have become a familiar feature of the regulatory landscape of health care.").

36. For a review of twenty-five years of disclosure rules applied to consumer financial decisions, see Hosea H. Harvey, *Opening Schumer's Box: The Empirical Foundations of Modern Consumer Finance Disclosure Law*, 48 U. MICH. J.L. REFORM 59, 59–116 (2014); *see also* Loewenstein, Sunstein & Golman, *supra* note 33, at 393 ("The Credit Card Accountability Responsibility and Disclosure (CARD) Act of 2009, the Affordable Care Act, and the Dodd-Frank Wall Street Reform and Consumer Protection Act are all packed with disclosure requirements.") (citation omitted).

37. *See* Abby K. Wook & Douglas M. Spencer, *In the Shadows of Sunlight: The Effects of Transparency on State Political Campaigns* 1 (Univ. of S. Cal. Law Legal Studies, Working Paper No. 15-29, 2016), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1901551 ("As government transparency has increased, mandatory disclosure has also increased . . . . Political campaigns are no exception. States and the federal government mandate that candidates disclose both personal financial information and the sources of their campaign finances . . . .") (citations omitted); *see also* Richard Briffault, *Updating Disclosure for the New Era of Independent Spending*, 27 J.L. & POL. 683, 683–720 (2012); Michael D. Guttentag, *On Requiring Public Companies to Disclose Political Spending*, 2014 COLUM. BUS. L. REV. 593, 593–662 (2014).

38. DOUGLAS G. BAIRD ET AL., GAME THEORY AND THE LAW 79 (1994) ("In the case of real estate sales, the doctrine of caveat emptor is giving way to laws requiring sellers to disclose whether the basement leaks or the neighbors are noisy.") (emphasis omitted).

39. My interest in disclosure regulation arose primarily from the study of securities markets regulation, an industry in which disclosure is a central pillar of federal regulation. Michael D. Guttentag, *An Argument for Imposing Disclosure Requirements on Public Companies*, 32 FLA. ST. U. L. REV. 123, 124 n.1 (2004) [hereinafter Guttentag, *Imposing Disclosure Requirements*]; *see also* Michael D. Guttentag, *Accuracy Enhancement, Agency Costs, and Disclosure Regulation*, 3 REV. L. & ECON. 611, 611–41 (2007), [hereinafter Guttentag, *Accuracy Enhancement*]; Michael D. Guttentag et al., *Brandeis' Policeman: Results from a Laboratory Experiment on How to Prevent Corporate Fraud*, 5 J. EMPIRICAL LEGAL STUD. 239, 239–74 (2008) [hereinafter Guttentag et al., *Brandeis' Policeman*]; Michael D. Guttentag, *Patching a Hole in the JOBS Act: How and Why to Rewrite the Rules that Require Firms to Make Periodic Disclosures*, 88 IND. L.J. 151, 151–212 (2013) [hereinafter Guttentag, *Patching a Hole*]; Michael D. Guttentag, *Protection from What? Investor Protection and the JOBS Act*, 13 U.C. DAVIS BUS. L.J. 207, 207–58 (2013).

The centrality of disclosure regulation in securities regulation was inspired in part by a several hundred-year-old practice of disclosing information about a firm and its relationships with the firm's agents to potential investors as discussed in Paul G. Mahoney, *Mandatory Disclosure as a Solution to Agency Problems*, 62 U. CHI. L. REV. 1047, 1054–68 (1995). Another factor motivating the use of disclosure rules to regulate securities markets was the supposition by Louis Brandies in a 1913 series of articles entitled *Other People's Money* that requiring disclosure would deter fraud. Brandeis wrote that: "Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most

Another approach to identifying the many uses of disclosure regulation is to specify the different types of problems disclosure regulations are designed to ameliorate. At least three justifications are regularly offered, either explicitly or implicitly, for using disclosure regulation. These are: 1) to help consumers be better informed, 2) to help align the interests of parties that otherwise might be competing, and 3) to deter fraud.

The first of these justifications, the effort to better inform consumers, is consistent with the broader goal of using regulation as a tool to empower buyers rather rely on more draconian approaches, such as restricting choice.[40] Relying on disclosure regulation allows regulators to avoid having to undertake a substantive review of product quality. I described this justification for reliance on disclosure regulation in the context of securities markets as follows: "When disclosure is required, the parties to a transaction are more fully informed, and so, presumably, made better off without the need for a regulator to evaluate the merits of particular transactions."[41]

There are several problems with implementing disclosure requirements based on the argument that doing so provides consumers more or better information. First, the usefulness of information depends crucially on the ability of the recipient of the information to process that information. More information, if it goes unused, does not provide the desired benefits. Second, even if more information does improve customer decision-making, this fact alone does not explain why regulatory intervention is needed as a supplement to market-based incentives to gather and distribute information.[42]

A second justification frequently offered for making disclosure mandatory is that requiring disclosure can help to ensure that the interests of competing parties are better aligned. The assumption is that the more information parties to a transaction are required to disclose, the easier it is for them to make sure

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efficient policeman." LOUIS D. BRANDEIS, OTHER PEOPLE'S MONEY AND HOW THE BANKERS USE IT 92 (1914).

40. *See, e.g.*, Loewenstein, Sunstein & Golman, *supra* note 33, at 394 ("[W]e examine situations in which disclosure serves the purposes of helping to protect consumers against their own propensity to err. Psychology and behavioral economics provide a new rationale for regulation that supplements traditional economic accounts . . . . The new rationale involves what might be called behavioral market failures . . . .") (citations omitted); Sage, *supra* note 35, at 1704 ("Nonetheless, one regulatory strategy has emerged as a favored approach of disparate constituencies: expanding the amount of information about the health care system circulating among consumers, providers, and voters.").

41. Guttentag, *Imposing Disclosure Requirements*, *supra* note 39, at 124.

42. This is why most arguments for disclosure regulation also include some form of market failure argument to explain why regulatory intervention is justified.

that their interests are well-aligned.[43] But, as with the claim that requiring disclosure leads to better informed customers, a justification for disclosure regulation based on the goal of better aligning interests fails to address why more information would improve outcomes or why regulatory intervention is a necessary supplement to market-based incentives to gather and distribute information.

A third justification for imposing disclosure requirements is that these requirements appear to provide a relatively low-cost way to deter untoward behavior. The deterrence of untoward behavior was one of the main justifications offered for federally regulating securities markets in the United States in the 1930s. When Franklin Delano Roosevelt, during his 1932 Presidential campaign, promised to enact federal legislation to protect investors, he cited the prophylactic benefits of requiring disclosure, echoing the sentiments of Louis Brandeis' 1914 book that: "Sunlight is said to be the best of disinfectants; electric light the most efficient policeman."[44]

In summary, one approach to identifying the uses of disclosure requirements is to list the many industries in which disclosure requirements play a central role in the regulatory scheme.[45] Another approach to identifying the uses of disclosure requirements is to identify the justifications most frequently offered for imposing disclosure requirements.[46] Either approach illustrates how ubiquitous and multi-purposed the use of disclosure requirements as a tool of regulation in the modern administrative state has become.

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43. In the parlance of securities regulation, this second justification would be described as using disclosure requirements to reduce agency costs, as compared to the first justification which is more likely to be characterized in the securities regulation context as related to efforts to enhance share price accuracy. For an analytical model exploring the relationship between these two potential benefits from regulation in the securities markets context, see Guttentag, *Accuracy Enhancement*, *supra* note 39, at 611–41.

A combination of the information provision and the agency cost reduction rationales emerges from work on disclosure regulation in health care. Sage, for example, describes some of the purported benefits of disclosure requirements as follows: "First, disclosure can promote competitive provision of health insurance and medical services . . . . This function of information, which the Article terms the 'competition rationale,' serves goals of transactional . . . efficiency. Second, disclosure can strengthen agency relationships and enforce fiduciary obligations . . . which th[is] Article calls the 'agency rationale' . . . .'" Sage, *supra* note 35, at 1710–11.

44. BRANDEIS, *supra* note 39, at 92. Roosevelt specifically referred to Brandeis' argument that "[p]ublicity is justly commended as a remedy for social and industrial diseases." *See* JOEL SELIGMAN, THE TRANSFORMATION OF WALL STREET: A HISTORY OF THE SECURITIES AND EXCHANGE COMMISSION AND MODERN CORPORATE FINANCE 41–42 (1982) (describing the securities regulation aspect of Roosevelt's campaign).

45. *See supra* notes 35–39 and accompanying text.

46. *See supra* notes 40–44 and accompanying text.

B. Analysis of Disclosure Regulation

In this section I survey two modes of analysis used to evaluate when disclosure regulation is likely to be an efficacious regulatory tool. The first approach I review is the use of the traditional tools of economic analysis to evaluate if or when disclosure regulation might enhance social welfare. The second approach I review is the use of insights from behavioral economics to evaluate if or when disclosure regulation might enhance social welfare.

The traditional economic analysis of disclosure regulation developed out of research into the larger topic of the economics of information. Starting with work published by John von Neumann in 1928, economists have paid increasing attention to the important ways in which information impacts a multitude of economic transactions.[47] This research into the links between economics and information has yielded several important insights, including: 1) highlighting how information asymmetries can affect economic transactions,[48] 2) identifying conditions under which all relevant information will become public without regulatory intervention (the "unraveling result"),[49] and 3) suggesting circumstances under which externalities are likely to arise when information is collected or disclosed.[50]

One of the best applications of traditional economic analysis to issues related to disclosure regulation is provided by Professor Steven Shavell in his 1994 article *Acquisition and Disclosure of Information Prior to Sale*. In this article Shavell shows how both the type of information to be disclosed and

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47. John von Neumann, *Zur Theorie der Gesellschaftsspiele*, 100 MATHEMATISCHE ANNALEN 295 (1928). With respect to the significance of John von Neumann's early contributions to the development of information theory, see Harold W. Kuhn & Albert W. Tucker, *John von Neumann's Work in the Theory of Games and Mathematical Economics*, 64 BULL. AM. MATHEMATICAL SOC'Y 100, 100–22 (1958).

48. *See, e.g.*, ANDREAU MAS-COLELL, MICHAEL D. WHINSTON & JERRY R. GREEN, MICROECONOMIC THEORY 437–50, 477–510, 716–24 (1995).

49. BAIRD ET AL., *supra* note 38, at 89–91 ("[T]he logic of unraveling [is] that someone with information will disclose it, rather than be subject to the inference that arises from the failure to disclose it when one can do so.").

50. *See, e.g.*, Loewenstein, Sunstein & Golman, *supra* note 33, at 392 ("Standard economic theory offers several explanations for why the provision of information occurring naturally, as a function of market forces, may be suboptimal."). For example, Loewenstein, Sunstein, and Golman identify one well recognized market failure in the provision of information: "We have noted that information, as a public good, may have more social value than private value and hence be underprovided relative to the social optimum." *Id.* at 396. On the other hand, expenditures on information might exceed socially desirable levels, if the acquisition of information allows one person to profit at the expense of another without any increase in social welfare. *See generally* Jack Hirshleifer, *The Private and Social Value of Information and the Reward to Inventive Activity*, 61 AM. ECON. REV. 561 (1971).

the nature of the information asymmetries between parties to a transaction might justify introducing a mandatory disclosure regime.[51] In their book, *Game Theory and the Law*, Professors Douglas Baird, Robert Gertner and Randal Picker extend Shavell's findings, and identify other ways in which the economics of information might inform when and how to use disclosure regulation to increase social welfare.[52] For example, they observe that one implication of the unraveling result is that in many circumstances "the allocation of the right or duty to inquire or disclose should not affect whether verifiable information is revealed."[53]

A second analytic approach used to estimate the costs and benefits of disclosure regulation is based on research in behavioral economics. Behavioral economics is the study of the ways in which people predictably deviate from what would be expected if their decision-making was based exclusively on perfectly rational calculations. Among the leading proponents of applying the insights from behavioral economics to the analysis of disclosure regulation are Professors George Loewenstein, Cass Sunstein, and Russell Golman. In a survey article aptly titled *Disclosure: Psychology Changes Everything* Loewenstein, Sunstein, and Golman argue that "even a modest enrichment in our understanding of the psychology of disclosers and/or recipients of disclosure can have dramatic consequences for the types of effects we should expect to, and in fact do, observe, as well as profound implications for policy."[54] They go on to survey in their article numerous studies showing that the traditional economic analysis of disclosure fails to predict how people actually react to disclosure requirements.[55] More specifically, to describe how a behavioral economics approach can improve our understanding of the likely effects of disclosure requirements, Loewenstein, Sunstein, and Golman separate psychological reactions to disclosure rules into the following seven categories: 1) limited attention and

51. Steven Shavell, *Acquisition and Disclosure of Information Prior to Sale*, 25 RAND J. ECON. 20 (1994). For an updated analysis of the tradeoffs identified in Shavell's article, see Oren Bar-Gill & Ariel Porat, *Disclosure Rules in Contract Law: Mandatory Disclosure, Voluntary Disclosure, and Post-Contract Disclosure* (forthcoming).

52. BAIRD ET AL., *supra* note 38, at 79–121.

53. *Id.* at 91. The authors also identify various circumstances where the unraveling result might not apply. *Id.* at 95–109.

54. Loewenstein, Sunstein & Golman, *supra* note 33, at 396.

55. *Id.* at 391–416.

awareness,[56] 2) inattention to missing information,[57] 3) motivated attention,[58] 4) biased probability judgments,[59] 5) moral licensing,[60] 6) social pressure and conflict avoidance,[61] and 7) the spotlight and tell-tale heart effect.[62]

Loewenstein, Sunstein, and Golman do not provide a justification for introducing this particular categorizing of how reactions to disclosure requirements deviate from the predictions provided by a rational expectations model of human behavior.[63] The absence of a justification for this particular partitioning is, I would argue, not surprising. As Jones and Goldsmith observe, "both behavioral law and economics and the underlying literature in cognitive psychology are far better at explaining that people often behave in ways inconsistent with traditional economic theory than they are at explaining why they do so."[64] One of the central claims in this article is that without introducing an evolutionary perspective, it is not possible to do much more than simply provide a list of the ways in which people's reactions to disclosure treatments deviate from what a rational expectations model of human behavior would predict.

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56. *Id.* at 398–99 ("Bounded attention renders many disclosures useless because consumers ignore them," and "people have only limited volitional control over how they allocate attention.").

57. *Id.* at 400 ("[P]eople typically pay even less attention to the absence of information than to its presence, even when both are equally informative.").

58. *Id.* ("When information is unpleasant to deal with, people often fail to attend to it.").

59. *Id.* at 401.

60. *Id.* at 402 ("[D]isclosure of misaligned incentives can in some cases backfire, hurting those it is intended to help.").

61. *Id.* at 402–03 ("[C]ustomers may fear that their failure to follow the advisor's recommendation is likely to be interpreted as a signal of distrust.").

62. *Id.* at 403 ("[The tell-tale heart] effect suggests that psychological factors may increase the effectiveness of disclosure when, from an economic standpoint, it might be expected to be superfluous.").

63. This limitation in the Loewenstein, Sunstein & Golman survey of the psychological effects of disclosure rules is similar to problems identified with findings in behavioral law and economics generally. *See generally* David A. Hyman & Thomas S. Ulen, *What Can PPACA Teach Us About Behavioral Law & Economics?*, *in* NUDGING HEALTH: HEALTH LAW AND BEHAVIOURAL ECONOMICS 59, 67 (I. Glenn Cohen et al. eds., 2016) ("if you turn law professors and regulators loose with a behavioral economics hammer, you should not be surprised that some of them will see nails everywhere they look"); Maril J. Rizzo & Douglas Glen Witman, *The Knowledge Problem of New Paternalism*, 2009 BYU L. REV. 905, 908–10 (stating that "[m]any have raised objections to the use of behavioral economics to justify paternalism" and arguing that policy makers do not "have access to the knowledge needed to implement welfare-improving paternalist [government] policies" because "the new paternalism spawned by behavioral economics faces a . . . knowledge problem" as a result of economists over-applying behavioral models) (italics omitted).

64. Jones & Goldsmith, *supra* note 3, at 446 (italics omitted); *see also* Owen D. Jones, *Why Behavioral Economics Isn't Better, and How it Could Be*, *in* RESEARCH HANDBOOK ON BEHAVIORAL LAW AND ECONOMICS (Joshua C. Teitelbaum & Kathryn Zeiler eds., 2016).

C. Questionable Efficacy of Disclosure Regulation

In the discussion above I reviewed the ubiquity of disclosure requirements, as well as efforts by both economists and psychologists to describe the ways in which disclosure rules are likely to alter behavior. In this Section, I briefly review scholarship that addresses if or when disclosure requirements offer an effective tool for regulating social activity.

There is much disagreement as to if or when disclosure regulation is effective. If anything, those skeptical about the efficacy of requiring disclosure appear to outnumber disclosure regulation proponents. Perhaps the most frequently mentioned concern about using disclosure requirements to regulate social activity is that there is too much information already available for the requirement that additional information be disclosed to increase social welfare. For example, in a recent working paper, Tess Wilkson-Ryan nicely observes: "Most serious observers of modern contracting concede that the current state of the world is disclosure overload."[65]

Critics of disclosure regulation can easily point to a number of situations where required disclosure has generated significant cost with no apparent benefit. For example, in two areas of the law where we rely heavily on disclosure regulation, executive compensation and political spending, the evidence suggests that the effects of disclosure regulation are mixed at best.[66] The "overload" critique is especially apt in the context of disclosures required

65. Tess Wilkinson-Ryan, *The Perverse Behavioral Economics of Disclosing Standard Terms* 3 (Univ. of Pa., Inst. for Law & Econ. Research, Paper No. 16-5, 2016), http://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=2634&context=faculty_scholarship (citing Ian Ayres & Alan Schwartz, *The No-Reading Problem in Consumer Contract Law*, 66 STANFORD L. REV. 545 (2014); Yannis Bakos, Florencia Marotta-Wurgler & David R. Trossen, *Does Anyone Read the Fine Print? Consumer Attention to Standard-Form Contracts*, 43 J. LEGAL STUD. 1, 19 (2014)).

66. For a brief overview of the debate on the efficacy of executive compensation disclosure, see Guttentag, *supra* note 37, at 615–16; *see also* Steven M. Davidoff & Claire A. Hill, *Limits of Disclosure*, 36 SEATTLE U. L. REV. 599, 604 (2013). *But see* Kin Lo, *Economic Consequences of Regulated Changes in Disclosure: The Case of Executive Compensation*, 35 J. ACCT. & ECON. 285 (2003). For intriguing work on the effect of executive compensation disclosure in the compensation provided to private college and university professors, see Brian D. Galle & David I. Walker, *Sunshine, Stakeholders and Executive Pay: A Regression-Discontinuity Approach* (Bos. Coll. Law Sch. Legal Studies, Research Paper No. 316, 2014), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2363013##. With respect to the efficacy of the disclosure of political spending information, see *supra* note 37.

to be made to consumers.[67] As Wilkson-Ryan observes: "Fine print is universally unread and functionally unreadable."[68]

If anything, requiring disclosure in the consumer context may be counter-productive, because, for example, such disclosures may lead consumers to be overly optimistic about their ability to use the information disclosed.[69] Nor does the available evidence support the hypothesis that fewer or more simplified disclosures will inevitably improve the helpfulness of the disclosed information.[70] As Professors Steven Davidoff Solomon and Claire Hill observe in their aptly titled article, *Limits of Disclosure*, "[b]etter information should, in principle, lead to better decisions, but other factors may be far more important."[71]

The case against disclosure regulation is not, however, without exception or challenge. There appear to also be many situations where disclosure regulation provides benefits that more than justify the costs of regulatory intervention. Some recent examples suggesting the efficacy of disclosure regulation come from such disparate fields as crime prevention,[72] payday

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67. *See, e.g.*, Lauren Willis, *Against Financial Literacy Education*, 94 IOWA L. REV. 197 (2008).

68. *See* Wilkinson-Ryan, *supra* note 65, at 7 (citing Omri Ben-Shahar & Carl E. Schneider, *The Failure of Mandated Disclosure*, 159 U. PA. L. REV. 647, 665, 687, 704–18 (2011) (documenting and explaining the overwhelming impossibility of reading disclosures across contract forms)). Another challenge with evidence of the behavioral effects is that it is difficult to determine how these various effects might balance against each other or how these might intersect with increasing public welfare. Alexei Alexandrov, Generalizing Lessons from Behavioral Economics Across Many Biases (Aug. 21, 2015) (unpublished manuscript) http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2576004.

69. For example, one study shows disclosure requirements backfire as a way to remedy consumers' underestimation of how likely they are to use mail in rebates. Molly Mercer & Ahmed E. Taha, *Unintended Consequences: An Experimental Investigation of the (In)effectiveness of Mandatory Disclosure*, 55 SANTA CLARA L. REV. 405 (2015); *see also* David W. Stewart & Ingrid M. Martin, *Intended and Unintended Consequences of Warning Messages: A Review and Synthesis of Empirical Research*, 13 J. PUB. POL'Y & MARKETING 1 (1994).

Yet another example of ineffective disclosure is provided by a study of disclaimers in mutual fund advertisements. Molly Mercer, Alan R. Palmiter, & Ahmed E. Taha, *Worthless Warnings? Testing the Effectiveness of Disclaimers in Mutual Fund Advertisements*, 7 J. EMPIRICAL L. STUD. 429 (2010).

70. Omri Ben-Shahar & Adam Chilton, *Simplification of Privacy Disclosures: An Experimental Test* (Univ. of Chi. Coase-Sandor Inst. for Law & Econ., Research Paper No. 737, 2016), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2711474 (finding that none of the commonly suggested simplification techniques help to inform respondents or affect their behavior).

71. Steven M. Davidoff & Claire A. Hill, *Limits of Disclosure*, 36 SEATTLE U. L. REV. 599, 603 (2013).

72. *See, e.g.*, Santiago Gómez et al., *Big Brother: Good Brother? CCTV Systems and Crime Rates in Medellín-Colombia* 9–10 (LACER-LACEA, Working Paper No. H41, K42,

lending,[73] securities regulation,[74] and tax collection.[75] Disclosure regulation is certainly not the unmitigated good that either its ubiquity or some of its more adamant proponents might suggest, but in at least some circumstances it does appear that its benefits outweigh its costs.

IV. AN EVOLUTIONARY PERSPECTIVE ON DISCLOSURE REGULATION

This Section adds an evolutionary perspective to the analysis of disclosure regulation. To do so I first make a general argument about why evolutionary analysis is likely to offer new insight into disclosure regulation. With this groundwork in place, I consider three specific ways in which the application of evolutionary analysis to the study of disclosure regulation might generate new policy insight, including: 1) highlighting when an obligation to share information is most likely to be efficacious, 2) suggesting when disclosure requirements are most likely to backfire, and 3) underlining the importance of context when implementing disclosure requirements. Finally, I offer some preliminary thoughts as to what a general framework linking evolutionary analysis and disclosure regulation might look like.

A. Why Evolutionary Analysis and Disclosure Regulation

The first issue I address in this Section is why evolutionary analysis is likely to offer new insight into disclosure regulation. For evolutionary analysis to advance our understanding of disclosure regulation it must be true that many of our reactions to disclosure regulations are influenced by behavioral predispositions shaped by evolutionary processes. If there is this

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2015), http://lacer.lacea.org/bitstream/handle/123456789/52981/lacea2015_cctv_systems_crime_rates.pdf?sequence=1 (finding that there was a decline in total crime after the installation of a camera even though there was no significant effect of the cameras on the operational capacity of police forces).

73. *See, e.g.*, Kathleen Burke et al., Information Disclosure and Payday Lending in Texas 1 (Oct. 2015) (unpublished manuscript) (on file with author) (finding that comparison of costs of payday loans can have a significant impact on demand for payday loans).

74. Guttentag, *Patching a Hole*, *supra* note 39, at 181–90 (summarizing research showing various benefits from mandatory disclosure regulation in securities markets); U.S. Securities and Exchange Commission, *Government-Business Forum on Small Business Capital Formation*, U.S. SECS. & EXCH. COMM'N 2:52:05 (Nov. 19, 2015), https://www.sec.gov/video/webcast-archive-player.shtml?document_id=gbforum111915 (Michael D. Guttentag testimony titled *The Unexpected Benefits of Mandatory Disclosure*).

75. In Norway when information about taxes paid became more readily available, taxes paid by the affected individuals increased by 3% at no incremental cost. Erlend E. Bø, Joel Slemrod, & Thor O. Thoresen, *Taxes on the Internet: Deterrence Effects of Public Disclosure*, 7 AM. ECON. J. ECON. POL'Y 36, 56 (2015).

link between reactions to disclosure rules and behavioral predispositions shaped by evolutionary processes then the best, and perhaps only, way to make sense of the multifaceted ways in which people respond to disclosure regulations is to situate those reactions into a context informed by evolutionarily salient considerations.

So the crucial question is whether there are links between reactions to disclosure regulation and behavioral predispositions shaped by evolutionary processes. I have identified elsewhere a list of factors that are useful in determining when a behavior is strongly influenced by behavioral predispositions shaped by evolutionary processes. These factors are:

> (1) evidence that the behavior occurs early and predictably in individual development, (2) evidence that the underlying logic of the behavior is inaccessible to conscious reflection (dumbfounding), (3) evidence of the presence of specialized capabilities that are particularly well-suited to carrying out the behavior, (4) evidence that the behavior occurs in all societies (universality), and (5) evidence that the behavior could be a product of evolutionary processes.[76]

A review of these five indications that a behavioral predisposition is shaped by natural selection suggests that many reactions to disclosure requirements are the product of these kinds of behavioral predispositions.[77] In particular, the second and fifth of the indicators listed above, dumbfounding and evidence that the behavior could be a product of evolutionary processes, strongly suggest that many reactions to disclosure requirements are influenced by behavioral predispositions shaped by evolutionary processes.[78]

Dumbfounding, the second of the five indicators listed above, occurs when a behavior is predictable, but the logic underlying the behavior is not accessible to conscious reflection. One well-studied example of dumbfounding occurs when people predictably make subtle distinctions when faced with hypothetical moral dilemmas but then are incapable of explaining or justifying these distinctions.[79]

Many experiments find precisely this type of dumbfounding in how people react to the disclosure of information. One simple example comes from research showing that people "learn to fear snakes and spiders more quickly

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76. Guttentag, *supra* note 8, at 285–86.
77. *Id.* at 327–28.
78. *See id.*
79. *Id.* at 292–93.

than they do guns and knives, even though the latter pose much greater threats to physical safety."[80] This heightened sensitivity to information about threatening animals makes sense from an evolutionary perspective, because of the mortal threat that snakes and spiders presented to our ancestors, but does not make sense from the perspective of rational concerns about dangerous objects in the twenty-first century.[81]

Another experiment, one designed to replicate some of the most salient features of corporate fraud, similarly found that a mandatory disclosure requirement affected subjects in predictable ways that the subjects themselves could not explain.[82] In this experiment, which I carried out with colleagues, small groups of subjects were provided an opportunity to either work together to cheat or to opt out and choose not to cheat.[83] We found that a simple disclosure requirement significantly reduced the likelihood that a small group would cheat, even though the substance of what we required participants to disclose was meaningless.[84]

Another example of dumbfounding occurring in the context of how people respond to disclosure requirements is provided by evidence about how people react when they sense that they are being observed. I use the term "spotlight" effects to describe changes in behavior that result from the perception that one's behavior is being observed.[85] Economic experiments provide much

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80. Maner & Kenrick, *supra* note 15, at 613. With respect to spider fears in particular, there is also evidence that predictable reactions to disclosure "occurs early and predictably in individual development," which futher supports the hypothesis that this particular reaction to the disclosure of new information is influenced by behavioral predispositions shaped by evolutionary processes. *See* Guttentag, *supra* note 8, at 285–86; D. H. Rakison & J. L. Derringer, *Do Infants Possess an Evolved Spider-Detection Mechanism?*, 107 COGNITION 381 (2008).

81. *See* Rakison & Derringer, *supra* note 80, at 382.

82. Guttentag et al., *Brandeis' Policeman*, *supra* note 39, at 239.

83. *Id.* at 258–60.

84. We told participants in the disclosure treatment in our study that their disclosures "would be reviewed by participants in a different study" without any significant economic consequences arising out of this third-party review. *Id.* at 265–67.

85. The spotlight terminology harkens back to the Brandeis' claim that: "Sunlight is said to be the best of disinfectants; electric light the most efficient policeman." BRANDEIS, *supra* note 39, at 92. Describing the ways in which being subject to a disclosure requirement can alter behavior as involving a spotlight effect was also suggested in an article by Thomas Gilovich, Victoria Husted Medvec, and Kenneth Savitsky. *See* Thomas Gilovich, Victoria Husted Medvec & Kenneth Savitsky, *The Spotlight Effect in Social Judgment: An Egocentric Bias in Estimates of the Salience of One's Own Actions and Appearance*, 78 J. PERS. SOC. PSYCHOL. 211 (2000). Loewenstein, Sunstein, and Golman also use the term "tell-tale heart" to describe the effects on the person making the disclosure: "At the same time, disclosure requirements can have surprising large effects on providers as a result of what we call the telltale heart effect." Loewenstein, Sunstein & Golman, *supra* note 33, at 396. The term tell-tale heart is based on an Edgar Allen

evidence of spotlight effects, and the spotlight effects observed in economic experiments almost certainly involve a significant amount of dumbfounding. For example, Terence Burnham and Brian Hare had subjects play a game that measured how willing the subjects were to make contributions to the public good from their own resources.[86] Half of the study's participants played the game in front of a computer that also displayed the image of a robot with human-like eyes. Burnham and Hare found that subjects exposed to this picture of a robot made more generous contributions than subjects who did not have this picture on their screen.[87] Burnham and Hare conclude that the robot's appearance (most likely its human-like eyes) triggered an evolutionarily salient stimulus.[88]

What is particularly elegant about the Burnham and Hare experiment is that it shows how a manipulation in an economic experiment, by triggering a spotlight effect, can affect behavior in ways that an evolutionary scientist, but neither the subjects themselves nor an economist could explain. Just the sense among study subjects that they were being watched, although not grounded in reality, was sufficient to significantly alter how generous they were.[89]

Poe short story of that name. Edgar Allen Poe, *The Tell-Tale Heart*, *in* THE OXFORD BOOK OF AMERICAN SHORT STORIES 92 (Joyce Carol Oates ed., 1992).

To be a bit more precise, my use of the spotlight terminology is more expansive than the usage embraced by Gilovich, Medvec, and Savitsky. In their article they only hypothesize and provide experimental evidence supporting the hypothesis that people overestimate the extent to which others are observing their behavior. *See* Gilovich, Medvec & Savitsky, *supra*, at 211. Gilovich, Medvec, & Savitsky do not explore the extent to which this misperception about the extent to which they are being observed affects subject behavior. *See generally id.*

86. Terence Burnham & Brian Hare, *Engineering Human Cooperation: Does Involuntary Neural Activation Increase Public Goods Contributions?*, 18 HUM. NATURE 88, 88 (2007).

87. *Id.* at 88, 98–99.

88. *Id.* at 99–100.

89. *See also* Melissa Bateson et al., *Cues of Being Watched Enhance Cooperation in a Real-World Setting*, 2 BIOLOGY LETTERS 412, 412 (2006) (finding an image of a pair of eyes increased contributions to collect money for drinks in a university coffee room); Kevin J. Haley & Daniel M.T. Fessler, *Nobody's Watching? Subtle Cues Affect Generosity in an Anonymous Economic Game*, 26 EVOLUTION & HUM. BEHAV. 245, 251 (2005) (finding a computer displaying eyespots substantially increased contributions in a dictator game). In a similar vein, see Robert Kurzban, *The Social Psychophysics of Cooperation: Nonverbal Communication in a Public Goods Game*, 25 J. NONVERBAL BEHAV. 241, 241 (2001) (asking subjects to engage in mutual eye gaze led to an increase in contributions in economic experiments).

More generally, the possibility that behavior observed in an experiment may result from behavioral predispositions that were developed through natural selection, but are not optimal in the particular experimental setting in which they occur, has also been used to explain why there is such widespread evidence of third-party punishment in economic experiments, even when carrying out this punishment can only be done at a personal cost. Jillian J. Jordan et al., *Third-Party Punishment as a Costly Signal of Trustworthiness*, 530 NATURE 473, 476 (2016)

Another indication, the fifth listed above, that the effects of disclosure requirements are influenced by behavioral predispositions shaped by natural selection is that these effects plausibly "could be [the] product of evolutionary processes."[90] The development of similar capabilities in other species is especially helpful in showing that a particular aspect of human behavior could be the product of evolutionary processes.[91] If other animals exhibit a particular behavioral capability in the absence of cognitive abilities comparable to humans then this provides evidence that this behavior is not exclusively a byproduct of human-like cognitive abilities.[92]

There is much evidence in other species of behavioral predispositions that are similar to those that affect how people respond to disclosure requirements. One simple example come from the heightened sensitivity in many species to moving objects as compared to still objects.[93] This heightened sensitivity is not surprising, because of the importance of determining when either predators or prey are nearby, but nonetheless does support the general proposition that how information is "disclosed" will affect the ability of many species, probably including humans, to effectively process that information.

There is also evidence that non-human species alter their behavior depending on whether or by whom they are being observed, a sensitivity similar to the spotlight effect described above.[94] One elegant study revealing the subtle sensitivity of non-humans to whether and even by whom their behavior is being observed was carried out by Professor Nicola Clayton and colleagues with western scrub jays.[95] Clayton and her colleagues found that western scrub jays decide whether to recache their supplies depending on whether they are being observed by kin or strangers.[96]

("Importantly, punishers need not be consciously seeking to signal their trustworthiness; at a proximate level, [third-party punishment] may be motivated by emotions like moral outrage. Thus, [third-party punishment] may be based on social heuristics rather than explicit reasoning, and is unlikely to be perfectly sensitive to context—signaling motives may 'spill over' to settings where [third-party punishment] cannot function as a signal . . . .") (footnotes omitted).

90. Guttentag, *supra* note 8, at 285–86.

91. *Id.* at 322–23.

92. *Id.* at 322.

93. The ability to readily track moving objects is known as the optokinetic reflex, and is expressed in a number of species. *See, e.g.*, JOHN ALCOCK, ANIMAL BEHAVIOR: AN EVOLUTIONARY APPROACH 132–35 (1993) (describing sensitivity to motion in the common toad visual system).

94. *See supra* note 87 (describing what constitutes a spotlight effect).

95. Joanna M. Dally, Nathan J. Emery & Nicola S. Clayton, *Food-Caching Western Scrub-Jays Keep Track of Who Was Watching When*, 312 SCI. 1662, 1662–65 (2016) (describing how one bird species keeps track of whether their previous caching was observed by conspecifics).

96. *Id.* at 1665.

How people process new information or respond to an obligation to disclose information can be explained, to some degree, by reasoned efforts to make sense of the world. But more appears to be going on as well. As suggested both by sensitivities observed in economic experiments that only make sense from an evolutionary perspective and by the behavior observed in other species, reactions to disclosure requirements cannot be fully explained by reference to general cognitive ability or a view of the mind as a blank slate.[97]

B. Areas of Policy Impact

In this Section I discuss the following three ways in which awareness of the links between evolutionary analysis and disclosure regulation can provide insight into how best to use disclosure regulation: 1) in highlighting circumstances under which an obligation to share information is most likely to be efficacious, 2) in suggesting when disclosure requirements are most likely to backfire, and 3) in underlining the importance of context when implementing disclosure requirements.

The prevalence and strength of spotlight effects makes sense from an evolutionary perspective.[98] One of the policy implications that follows is that in many situations a disclosure requirement will alter behavior more than would be expected from an analysis based solely on rational actor considerations. Because of this heightened sensitivity, in the right situation even minimal disclosure requirements might provide a useful tool for altering behavior.

Findings from several studies support the conjecture that disclosure requirements can significantly alter behavior even when the effects on the recipients of the disclosed information are minimal. For example, calorie labeling requirements proved useful in reducing the caloric content of foods offered at restaurants not because consumers changed their behavior in light of the new information, but rather because restaurants chose to reduce the caloric content of the foods they offered in response to the new disclosure requirements.[99] Similarly, requiring energy-efficiency labeling on appliances in Europe led to an increase in the manufacturing and sales of more energy

97. *See generally* STEVEN PINKER, THE BLANK SLATE: THE MODERN DENIAL OF HUMAN NATURE (2002).

98. *See supra* note 87 describing what constitutes a spotlight effect.

99. Alexa Namba et al., *Exploratory Analysis of Fast-Food Chain Restaurant Menus Before and After Implementation of Local Calorie-Labeling Policies, 2005–2011*, U.S. CTR. FOR DISEASE CONTROL (June 2013), http://www.cdc.gov/pcd/issues/2013/pdf/12_0224.pdf.

efficient products, even though customers largely ignored the new information.[100] These spotlight effects, and, therefore, the potential benefits from requiring disclosure appear to be particularly pronounced in the context of encouraging prosocial behavior.[101]

A second policy insight offered by identifying links between evolutionary analysis and disclosure regulation is that these links suggest areas where the application of disclosure requirements are more likely to backfire. More specifically, deviations from rationality are likely to be greatest in disclosure situations that most directly trigger evolutionarily salient considerations such as disclosures that trigger a disgust reaction[102] or concerns about one's perceived status within a group.[103] This could be problematic when the information disclosed is intended to be considered from a more reasoned perspective.

There are several real world examples where disclosure requirements backfire because they trigger behavioral predispositions that could be logically anticipated when an evolutionary perspective is adopted. One such example comes from the disclosure of troubling but low risk complications (such as collapsing jawbones) from use of bisphosphonates, a drug to treat osteoporosis.[104] Doctors generally agree that for most patients use of

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100. Paul Waide & Christine Egan, *A Multi-Country Comparative Evaluation of Labelling Research*, *in* ECEEE 2005 SUMMER STUDY—WHAT WORKS AND WHO DELIVERS? 811, 813–14 (2005).

101. For example, exposing participants in a study to statements about morality that were phrased in more relativist (as compared to absolutist) terms increased the likelihood that the subjects would both cheat in a subsequent raffle and engage in petty theft. Tage S. Rai & Keith J. Holyoak, *Exposure to Moral Relativism Compromises Moral Behavior*, 49 J. EXPERIMENTAL SOC. PSYCHOL. 995, 1000 (2013) ("Our results move beyond previous studies by demonstrating causal effects of moral absolutism and moral relativism on actual engagement in immoral behavior.").

Field studies have also shown that seemingly unrelated disclosures can alter how willing people are to act in a prosocial manner. Cicero and Shen, for example, report that "local corporate insiders engage in fewer suspect behaviors in the year after a political scandal is revealed." David C. Cicero & Mi Shen, Do Executives Behave Better When Dishonesty is More Salient? (June 17, 2016) (unpublished manuscript) http://ssrn.com/abstract=2748258. Conversely, another study finds that when exposed to stimuli that made study participants feel anxious or threatened, the study participants began to act in a more unethical manner. Maryam Kouchaki & Sreedhari D. Desai, *Anxious, Threatened, and Also Unethical: How Anxiety Makes Individuals Feel Threatened and Commit Unethical Acts*, 100 J. APPLIED PSCYHOL. 360, 360 (2015).

102. *See, e.g.*, James Gorman, *Survival's Ick Factor*, N.Y. TIMES, Jan. 23, 2012, at D1 (providing an excellent overview of research on disgust).

103. *See, e.g.*, Maner & Kenrick, *supra* note 15, at 623 (discussing the importance of status).

104. Gina Kolata, *Fearing Drugs' Rare Side Effects, Millions Take Their Chances with Osteoporosis*, N.Y. TIMES, June 1, 2016, at A1 ("Millions of Americans are missing out on a chance to avoid debilitating fractures from weakened bones, researchers say, because they are terrified of exceedingly rare side effects from drugs that can help them.").

bisphosphonates improves patient quality of life, but the drug is severely underutilized, because of disclosure of this one exceedingly rare but viscerally unpleasant outcome.[105] Sensitivity to this kind of information is entirely consistent with development of behavioral predispositions that lead people to avoid "risky" materials, particularly when those materials are to be consumed.

Another example of the adverse consequences of heightened and potentially unwanted sensitivity to certain disclosures comes from the effects of exceedingly graphic cigarette warnings. The goal of including these more graphic warnings on cigarettes was to discourage smoking. But this logic did not take into account the fact that the graphic information triggered a competing behavioral predisposition that makes sense from an evolutionary perspective: the disgust reaction. The disgust reaction helps to explain the otherwise perplexing result in a study finding that more graphic warnings had less of a deterrent effect than less graphic warnings on cigarettes.[106] As Loewenstein, Sunstein, and Golman note, "many studies indicate that warnings that combine pictures and text are more effective than text alone in decreasing demand for cigarettes . . . ."[107] Yet they also observe "there is some danger that the use of pictorial warnings could backfire; consumers might direct their attention away from the gruesome pictures and thus insulate themselves from the warning information."[108] Conversely, one of the problems with mandatory executive compensation disclosures may be that these disclosures trigger a status contest, an effect which makes sense from an evolutionary perspective but that ultimately results in increased average compensation, which is the exact opposite of the intended result.[109]

A third policy insight offered by identifying links between evolutionary analysis and disclosure regulation is that these links help to explain why the effects of disclosure requirements are so highly sensitive to what appear to be relatively minor changes in context. This high degree of sensitivity to context is entirely consistent with the "modular" view of cognition and behavior suggested by adopting an evolutionary perspective when studying

105. *Id.*

106. Ron Borland et al., *Impact of Graphic and Text Warnings on Cigarette Packs: Findings from Four Countries over Five Years*, 18 TOBACCO CONTROL 358, 361–62 (2009).

107. Loewenstein, Sunstein & Golman, *supra* note 33, at 410.

108. *Id.* (citing Sabine Loeber et al., *The Effect of Pictorial Warnings on Cigarette Packages on Attentional Bias of Smokers*, 98 PHARMACOLOGY BIOCHEMISTRY & BEHAV. 292, 292 (2011)).

109. For a brief review of the limitations of executive compensation disclosure see Guttentag, *supra* note 37, at 615–16.

human behavior.[110] I noted above that several studies have found that altruism and the endowment effect observed in economic experiments are more sensitive to change in context than might be expected.[111] As an article in the *Financial Times* aptly observes: "This patchwork of sometimes-fragile psychological results hardly invalidates the whole field but complicates the business of making practical policy."[112]

Context sensitivity is also evident in the ways that participants in economic experiments react to disclosure rules, as shown by a series of studies on the effects of conflict of interest disclosures carried out over the last decade by Professors Daylian Cain, George Loewenstein, and Sunita Sah among others.[113] The first experiments these researchers carried out on the effects of the disclosure of a conflict of interest suggested that requiring the

110. *See supra* notes 19–23 and accompanying text.

111. *See supra* notes 20–23 and accompanying text.

112. Tim Harford, *Behavioral Economics and Public Policy*, FIN. TIMES (Mar. 21, 2014), http://www.ft.com/content/9d7d31a4-aea8-11e3-aaa6-00144feab7de. One response to the critique that findings from the behavioral law and economics research are hodgepodge is to categorize these behaviors as a logical implication of bounded rationality. As Jones and Goldsmith observe: "[o]ver the years, economists and scholars of 'behavioral law and economics' (BLE) have come to attribute many such irrationalities to a combination of 'bounded rationality' and cognitive fallibilities." Jones & Goldsmith, *supra* note 3, at 445 (footnotes omitted). But such an explanation has a limitation in terms of its fit with the evidence which suggests that deviations from rationality are not solely the result of limited human "computing speed." *Id.* For articles identifying problems with a general bounded rationality explanation for deviations from a rational expectations model, see *id.* at 447 n.126.

113. Daylian M. Cain, George Loewenstein & Don A. Moore, *The Dirt on Coming Clean: Perverse Effects of Disclosing Conflicts of Interest*, 34 J. LEGAL STUD. 1, 1 (2005) [hereinafter *The Dirt on Coming Clean*] (finding a disinhibitory effect of a disclosure treatment in a setting crafted to mirror a conflict of interest transaction); s*ee also* Daylian M. Cain, George Loewenstein & Don A. Moore, *When Sunlight Fails to Disinfect: Understanding the Perverse Effects of Disclosing Conflicts of Interest*, 37 J. CONSUMER RES. 836, 836 (2011) (identifying strategic exaggeration and moral licensing as psychological mechanisms by which disclosure can lead advisors to give more-biased advice). In 2013, Sunitah Sah, George Loewenstein, and Daylian Cain reported results showing that while "disclosure [of a conflict of interest] can decrease advisees' trust in the advice, it can also increase pressure to comply with that advice if advisees feel obliged to satisfy their advisors' personal interest." Sunitah Sah, George Loewenstein & Daylian M. Cain, *The Burden of Disclosure: Increased Compliance with Distrusted Advice*, 104 J. PERSONALITY & SOC. PSYCHOL. 289, 289 (2013); *see also* Sunitah Sah, Angela Fagerlin & P. Ubel, *Effect of Physician Disclosure of Specialty Bias on Patient Trust and Treatment Choice*, 113 PROC. NAT'L. ACAD. SCI. 7465 (2016); Sunitah Sah & George Loewenstein, *Conflicted Advice and Second Opinions: Benefits, But Unintended Consequences*, 130 ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES 89 (2015); Sunitah Sah, Don A. Moore & Robert J. MacCoun, *Cheap Talk and Credibility: The Consequences of Confidence and Accuracy on Advisor Credibility and Persuasiveness*, 121 ORGANIZATIONAL BEHAV. & HUM. DECISION PROCESSES 246 (2013).

disclosure of a conflict of interest would have a strong disinhibitory effect.[114] In fact, these first experiments suggested that the disinhibitory effect from requiring disclosure might be so large that the mandatory disclosure of a conflict of interest would actually exacerbate rather than ameliorate conflict of interest problems.[115]

However, subsequent experiments on the effects of requiring disclosure of a conflict of interest revealed that responses to this kind of disclosure requirement were much more complex and sensitive to small changes in context than might otherwise have been expected. For example, Sah working with colleagues found that changing the context in which a conflict of interest arises to a more explicitly medical context affected how people reacted to a conflict of interest disclosure requirement.[116] Similarly, in 2013 Sah and Loewenstein reported that a conflict of interest disclosure requirement had a salutatory effect in a setting where subjects had the choice of whether to enter into a conflict of interest transaction knowing that the conflict, if entered into, would have to be disclosed.[117] Sah and Lowenstein conclude from the result of this scenario: "[m]andatory and voluntary disclosure can deter advisors from accepting conflicts of interest so that they have nothing to disclose except the absence of conflicts."[118] This suggestion was the opposite of the policy recommendation from the earlier study finding a strong disinhibitory effect from requiring the disclosure of a conflict of interest.[119]

The research findings of Cain, Loewenstein, and Sah and their various colleagues on the effects of requiring the disclosure of a conflict of interest would be quite surprising if human behavior were solely the product of a rationality machine or a few broad forces defining human psychology.[120] However, the fact that many aspects of human behavior, such as responses to the disclosure of a conflict of interest, are highly context sensitive in ways that probably only make sense from an evolutionary perspective is entirely consistent with the hypothesis that our behavioral predispositions are shaped by natural selection.

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114. *The Dirt on Coming Clean*, *supra* note 113.

115. *Id.*

116. Sah, Fagerlin & Ubel, *supra* note 113.

117. Sunitah Sah & George Loewenstein, *Nothing to Declare: Mandatory and Voluntary Disclosure Leads Advisors to Avoid Conflicts of Interest*, 25 PSYCHOL. SCI. 575, 575 (2013). In the language of game theory they included an outside option in this experiment, whereas earlier studies by these researchers did not include this outside option. For a discussion of outside options in experiments, see Guttentag et al., *Brandeis' Policeman*, *supra* note 39, at 248.

118. Sah & Lowenstein, *supra* note 117 (emphasis omitted).

119. *The Dirt on Coming Clean*, supra note 113.

120. *See supra* notes 113–118 and accompanying text.

This high degree of context sensitivity has implications for the use of disclosure regulation as a policy tool. Nuanced sensitivity to changes in context presents an additional challenge to those who offer disclosure regulation as a way to regulate social activity.

C. A General Framework

In this final Section I briefly consider what a general framework connecting evolutionary analysis and disclosure regulation might look like. The reason to develop a general framework is that doing so offers a way to advance our understanding of responses to disclosure requirements beyond simply providing a listing of deviations from the predictions of a rational expectations model of human behavior.

To develop a general framework connecting evolutionary analysis and disclosure regulation it is helpful to first separate out the impact of disclosure requirements into two broad categories. On the one hand, disclosure requirements can have an impact by placing someone under an obligation to disclose information. I have used the term "spotlight" effects to describe the effects of being required to disclose information.[121] On the other hand, the impact of disclosure rules might arise from effects on the recipient of the newly disclosed information. To refer to the effects of disclosure requirements on the recipients of the disclosed information I use the term "comprehension" effects.[122]

The next step in presenting a general framework connecting evolutionary analysis and disclosure regulation is to organize the behavioral predispositions triggered by disclosure requirements into categories that are salient from an evolutionary perspective. There are several ways in which evolutionary psychologists partition human behavior to highlight how various types of behavior align with evolutionarily salient challenges, including in terms of various aspects of social life,[123] in terms of various stages of life history,[124] and in terms of various challenges faced in life's

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121 *See supra* note 87 describing what constitutes a spotlight effect.

122. The terminology I adopt, spotlight effects and comprehension effects, is similar to the "supply-side" and "demand-side" effects of disclosure terminology used in Loewenstein, Sunstein & Golman, *supra* note 33, at 393–94.

123. *See supra* note 25 and accompanying text.

124. *See* Williams, Sng & Neuberg, *supra* note 25 (citing ERIC L. CHARNOV, LIFE HISTORY INVARIANTS: SOME EXPLORATIONS OF SYMMETRY IN EVOLUTIONARY ECOLOGY (1993); DEREK A. ROFF, THE EVOLUTION OF LIFE HISTORIES: THEORY AND ANALYSIS (1992); STEPHEN C. STEARNS, THE EVOLUTION OF LIFE HISTORIES (1992)).

struggles.[125] Because disclosure regulations are very much a tool of social regulation, I choose to partition their effects based on the various social domains into which behavior can be cabined based on the taxonomy offered by Maner and Kenrick.[126]

The result is a segmentation of disclosure effects into the categories identified in the table below:

Domains of Social Life and the Efficacy of Disclosure

	Evolutionarily salient domains of social life				
	Coalition formation	**Status**	**Self-protection**	**Mating**	**Parental care**
Spotlight effects (effects on party making disclosure)	Disclose information showing one is a cooperator (*e.g*, Jordon et al., 2016; Cicero & Shen '16)	Disclose information showing superior position (*e.g*, Davidoff Solomon & Hill '13)	Avoid disclosures that create risks (*e.g*, Guttentag et al., 2009)	Disclose information showing superior resources	Disclose information showing willingness to invest resources in offspring
Comprehension effects (effects on party receiving disclosure)	Heightened sensitivity to information revealing whether others are cooperators (*e.g*, Sah et al., JPSP '13).	Heightened sensitivity to information revealing status (*e.g*, Davidoff Solomon & Hill '13)	Information about level of threat (Williams, Eng, & Neuberg '16)	Heightened sensitivity to information revealing resources	Heightened sensitivity to information revealing willingness to invest resources in offspring

In the above table, I have filled in some of the boxes with not only a brief summary of the relevant phenomenon but also by citing some of the relevant studies discussed elsewhere in this article. For example, in the box of the table in which the row is "Comprehension effects" and the column is "Coalition formation" I have included a reference to *The Burden of Disclosure: Increased Compliance with Distrusted Advice*, an article published in 2013 by Sah, Loewenstein, and Cain.[127] This article reports on a study finding that when there is a disclosure of a conflict of interest, the recipients of the disclosure experiences "increase[d] pressure to comply with that advice if advisees feel obliged to satisfy their advisors' personal interests."[128] This finding describes the effects of a disclosure on the recipient of the information, which is why it is included in the second row (comprehension effects) rather than the first row (spotlight effects). The study also shows how a recipient of information may use that information to try to ensure they are

125. *See* Buss, *supra* note 25.
126. Maner & Kenrick, *supra* note 15.
127. Sah, Lowenstein & Cain, *supra* note 113.
128. *Id.* at 289.

part of a particular coalition, in this case a coalition with the doctor who has elected to disclose the information. This is why this study is placed in the column labeled "Coalition formation."

Although preliminary, the table above shows how a framework connecting evolutionary analysis and disclosure regulation can provide a more nuanced way to catalog and understand deviations from rationality observed in how people react to disclosure requirements.

V. CONCLUSION

The mandated disclosure of information is a ubiquitous tool of regulation, but our understanding of how these disclosure rules work, or do not work, is increasingly fragmented and confusing. Putting the panoply of disclosure rule effects into an evolutionary context can bring order to our analysis of this important regulatory tool, introducing an approach to the analysis of disclosure regulation that may prove helpful not only in theory, but also in practice.