Malleable Rationality

STEPHANIE PLAMONDON BAIR*

In 1998, Christine Jolls, Cass Sunstein, and Richard Thaler published A Behavioral Approach to Law and Economics, one of the most important pieces of scholarship in decades. Their article famously proposes a departure from the neoclassical law and economics approach to legal analysis. Breaking from neoclassical law and economics' rational actor construct, the authors apply empirical insights about human behavior to introduce the concept of a boundedly rational actor limited by cognitive constraints. Over the past two decades, the behavioral law and economics approach, with its focus on the boundedly rational actor, has contributed needed realism to legal analyses.

Unfortunately, the current approach to behavioral law and economics is incomplete. Indeed, sometimes it even conflicts with empirical lessons about how the brain actually works. In particular, rationality is not independent of policy but instead has a malleable character that can be molded in long-lasting ways over time by specific laws and policies. By overlooking the malleable nature of rationality, behavioral law and economics cannot reach its full potential, and in fact, may harm the very people it is intended to benefit. A policy enacted to preserve consumer autonomy, for instance, may actually undermine autonomous decision-making in the long term.

In this Article, I take the first step in remedying this oversight. Drawing on the insights of neuroscience, I explain why rationality is not independent of policy and what this means for behavioral law and economics. Working from examples in advertising and criminal law, I explain that malleable rationality can and should be accounted for. Doing so will increase the prescriptive and normative power of behavioral law and economics, and prevent policies from being introduced that undermine rather than advance social welfare.

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* Stephanie Plamondon Bair, Associate Professor, BYU Law School. Thank you to Clark Asay, Dan Burk, Elysa Dishman, Martha Farah, Cathy Hwang, Matthew Jennejohn, Owen Jones, Dmitry Karshtedt, Jonathan Masur, Mark McKenna, David Moore, Emily Murphy, Aaron Nielson, Andres Sawicki, Jeremy Sheff, Lisa Grow Sun, Avishalom Tor, Stephen Yelderman, participants in the 2016 Rocky Mountain Junior Scholars Conference, participants in the J. Reuben Clark Law Society Conference, participants in the University of Utah Law and Biomedicine Colloquium, participants in the Works in Progress Intellectual Property 2017 Conference at Boston University, participants in the 2017 BioLawlapalooza at Stanford Law School, participants in the 2017 Junior Faculty Forum for Law and STEM at Penn Law School, and participants in the Notre Dame Faculty Colloquium for helpful insights and comments on earlier drafts.

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I. INTRODUCTION

How do people behave in the real world and what does it mean for law? That question has prompted a fierce debate. Scholars like Ronald Coase and Richard Posner have championed the neoclassical law and economics approach that has dominated legal scholarship for decades.[1] The approach assumes that

[1] *See, e.g.*, Richard A. Epstein, *Law and Economics: Its Glorious Past and Cloudy Future*, 64 U. CHI. L. REV. 1167, 1168 (1997); Anne C. Dailey, *Striving for Rationality*, 86 VA. L. REV. 349, 351 (2000) (reviewing JONATHAN LEAR, OPEN MINDED: WORKING OUT

people behave completely rationally—that they have unlimited capacity to process choice-relevant information and that, after processing this information, they will invariably choose the option that maximizes their personal utility.[2] More recently, however, the behavioral law and economics model, backed by Christine Jolls, Cass Sunstein, and others, has been gaining traction. It uses behavioral research to show how people are "boundedly rational."[3] According to behavioral law and economics, real people suffer from cognitive limitations and are unable to process all relevant information when making a choice.[4] And even if they could discern the utility-maximizing path, behavioral economists explain that actors often do not choose this option for a variety of predictable reasons.[5]

For all the reasons identified by Jolls and Sunstein, behavioral law and economics is a welcome advance over neoclassical law and economics and a more realistic way to conduct legal analyses.[6] But it is far from perfect. To the contrary, both it and neoclassical rationality models largely ignore the fact that people's brains change with experience over time.[7] In the language of neuroscience, this is known as plasticity,[8] and it has major implications for rationality. First, it means that rationality—whether neoclassical or bounded—is not independent of policy, but depends on the particular experiences we create for citizens through our policy choices. Relatedly, it means we can expect

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THE LOGIC OF THE SOUL (1998)); *see also* Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1473 (1998) (noting that criticisms of law and economics are "almost as old as the field itself").

[2] RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 3–4 (6th ed. 2003).

[3] *See* Jolls et al., *supra* note 1, at 1477–78.

[4] *Id.* at 1477.

[5] *See id.* at 1479 (discussing bounded willpower).

[6] *See id.* at 1473–74. *But see* Gregory Mitchell, *Alternative Behavioral Law and Economics*, *in* THE OXFORD HANDBOOK OF BEHAVIORAL ECONOMICS AND THE LAW 183, 184 (Eyal Zamir & Doron Teichman eds. 2014) ("Until significant changes are made to move [behavioral law and economics] toward empirically tested, domain-specific prescriptions, there is little reason to believe that [its] prescriptions will be more effective than those offered by [neoclassical law and economics]."); William H.J. Hubbard, *Quantum Economics, Newtonian Economics, and Law* 6, 36–37 (Univ. of Chi. Law Sch. Coase-Sandor Inst. for Law & Econ., Working Paper No. 799, 2017), https://ssrn.com/abstract=2926548 [https://perma.cc/553K-CMH3] (arguing that neoclassical and behavioral law and economics approaches are more similar to each other than often portrayed and that Coase in particular endorsed a more realistic view of human behavior than he is often credited for).

[7] *See* Owen D. Jones, *Why Behavioral Economics Isn't Better, and How It Could Be* 10 (Vanderbilt Law Sch., Law & Econ. Working Paper No. 14-30, 2014), https://ssrn.com/abstract=2504776 [https://perma.cc/G52Y-S48J] (forthcoming 2018 in RESEARCH HANDBOOK ON BEHAVIORAL LAW AND ECONOMICS) (claiming that behavioral law and economics should be concerned with "When?" questions such as how biases and heuristics may change over time, with experience, age, or training).

[8] Frank W. Stahnisch & Robert Nitsch, *Santiago Ramón y Cajal's Concept of Neuronal Plasticity: The Ambiguity Lives On*, 25 TRENDS IN NEUROSCIENCE 589, 589–90 (2002).

characteristics of individual decision-making to change in long-lasting ways over time as people live with these policies. Hence, rationality itself—not just preferences, and not just irrelevant features of decision-making, but individual decision-making *capacity*—is malleable. Behavioral law and economics proponents have been rightly concerned with how policy should respond to the fact of bounded rationality. But they have failed to recognize that bounded rationality will respond in turn to whatever policies we enact.

Due to the malleable character of rationality, a policy passed at *time* A will have long-term psychological and physiological effects on a governed person.[9] She will be changed by her experiences in a world with that policy.[10] This change, whatever it is, may make it either more or less likely that she will be capable of acting in rational ways in response to the same or different policies much later, at *time* B. This is so not just because (as neoclassical and behavioral law and economics scholars have recognized)[11] her preferences may have changed, or even because (as behavioral law and economics scholars have recognized)[12] irrelevant features of the decision that differ from *time* A to *time* B might affect her thinking as a boundedly rational actor. It is because her *inherent capacity* for rational thinking has been molded in long-lasting ways by the policies enacted at *time* A.[13] To use the language of bounded rationality, a policy choice at *time* A might have instilled in our citizen particular long-lasting biases[14] that simply would not have existed had that choice not been made. Or she might express certain biases—again, in a "sticky" and long-lasting way—to a greater or lesser degree than she would have otherwise.[15] In some cases, our policy inputs at *time* A will enhance people's abilities to act in desired ways at *time* B.[16] In other cases, they might undermine people's later ability to respond to laws in the way we expect or want them to.[17]

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[9] *See, e.g.*, Jacob Goldin, Essay, *Which Way To Nudge? Uncovering Preferences in the Behavioral Age*, 125 YALE L.J. 226, 229, 231 (2015) (describing the ways that government policies can affect rational decision-making).

[10] *See id.*

[11] *See* Chrisoula Andreou, *Dynamic Choice*, STAN. ENCYCLOPEDIA PHIL. (Sept. 2, 2016), https://plato.stanford.edu/entries/dynamic-choice/ [https://perma.cc/S8AC-29DW] (describing the "dynamic choice problem" wherein people are imperfect at predicting their future preferences).

[12] *See, e.g.*, Goldin, *supra* note 9, at 240–41.

[13] *See* Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCI. 1124, 1124 (1974).

[14] *See id.*

[15] *See* Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 CALIF. L. REV. 1051, 1112 (2000) (describing the effect of the status quo bias which causes contracting persons to adhere more closely to default rules in a transaction).

[16] *See, e.g.*, Goldin, *supra* note 9, at 229, 231 (noting that government policies could "nudge" citizens' choices in directions that could improve their welfare, such as putting health warnings on cigarettes).

[17] *See id.* at 229–30.

Whatever the ultimate outcome, the point is that rationality depends on policy. Policy decisions today have real consequences, not just for the decisions people make or the preferences they exhibit tomorrow, but for their inherent capacity to make these decisions—for the particular flavor of rationality they exhibit in the future. If we are serious in our quest to design legal institutions in ways that are likely to elicit the desired responses of real rather than hypothetical people, this is a reality that needs to be accounted for, especially if we wish to avoid unintended consequences. A policy enacted to preserve consumer autonomy, for instance, may—due to the lasting effects on the brains of people living with the policy—actually undermine autonomous decision-making in the long term.[18] And policies that determine income distribution and exposure to various types of media may hamper efforts in the seemingly unrelated area of criminal deterrence.[19]

Despite the potential complexity a malleable model of rationality introduces, we can at least begin to account for its intricacies. Bounded rationality works as a model of behavior because people depart from rational behavior in predictable and empirically measurable ways.[20] Likewise with malleable rationality. Neuroscience and behavior studies are beginning to show how specific policies change people's decision-making capacity in the long term.[21] If we can predict, based on empirical research, how rationality will change in response to a given policy, we can account for it. And we should.

The rest of the Article proceeds as follows. Part II explores our evolving understanding of human behavior and how decision-making models have grown more sophisticated by incorporating behavioral empirical research into a concept of the boundedly rational actor. In Part III, I argue that it's time to take the next step and recognize that rationality is a malleable quality grounded in the neuroscientific concept of neuroplasticity. After introducing the concept of malleable rationality, I use examples from criminal and advertising law to illustrate how a failure to account for malleable rationality can lead to ineffective and even counter-productive policy making. In Part IV, I move from the specific to the general and explore the broad implications of the phenomenon for law and policy analyses.

II. RATIONAL CHOICE THEORY AND ITS LIMITS

To analyze the effects of specific laws and policies, we need to have some idea of how people—its targets—will respond to them. Here, I explore law's evolving understanding of human behavior, from neoclassical rationality to the

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[18] *See infra* Part III.B.2.

[19] *See infra* Part III.B.1.

[20] *See* DAN ARIELY, PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS (2008) (describing how people depart from rational behavior in predictable ways).

[21] *See* Jones, *supra* note 7, at 23–28 (explaining how neuroscience can enrich the behavioral law and economics approach).

more complex and behaviorally accurate bounded rationality. In doing so, I set the stage for taking the next step toward a malleable understanding of rationality.

A. *Rationality*

The law and economics movement came to prominence in the late 1960s and early 1970s[22] and for at least two decades enjoyed status as a (perhaps *the*) dominant mode of legal analysis.[23] Law and economics concerns itself with the efficiency of legal rules.[24] It posits that legal rules have efficiency consequences—the potential to either enhance or undermine social welfare—and that these consequences should be considered when formulating the rules.[25]

The efficiency implications of legal rules flow in part from governed individuals' response to these rules.[26] Law and economics proposes that people respond to legal rules in ways that are either socially beneficial or socially detrimental.[27] A task of the approach is to formulate rules that encourage the socially beneficial behaviors and discourage the socially detrimental ones.[28]

But how can we predict how people will respond to legal rules? Enter the rational actor.[29] Neoclassical law and economics presumes that people will behave rationally when presented with an incentive or otherwise called on to make a choice.[30] They will choose the alternative that maximizes their own expected utility.[31] Inherent in this presumption is an assumption about how

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[22] Epstein, *supra* note 1, at 1167–68.

[23] *See* Paul H. Rubin, *Law and Economics*, CONCISE ENCYCLOPEDIA OF ECON. (2008), http://www.econlib.org/library/Enc/LawandEconomics.html [https://perma.cc/GR3X-NM8R].

[24] *See, e.g.*, Louis Kaplow & Steven Shavell, *Principles of Fairness Versus Human Welfare: On the Evaluation of Legal Policy* 2 (Harvard John M. Olin Ctr. for Law, Econ. & Bus., Discussion Paper No. 277, 2000), https://ssrn.com/abstract=224946 [https://perma.cc/NX3K-6PRT].

[25] *See id.* at 3–4 (arguing that economic analyses of law that focus on human welfare are superior to noneconomic fairness-based policy approaches); *see also* Korobkin & Ulen, *supra* note 15, at 1054.

[26] Korobkin & Ulen, *supra* note 15, at 1055 ("Law and economics is, at root, a behavioral theory, and therein lies its true power. The concern of law and economics with how actors in and subject to the legal system respond to legal directives (and would respond to hypothesized changes in those directives) now permeates the mainstream of legal academic thought . . . .").

[27] *See id.* at 1054.

[28] *See id.*

[29] *See* William M. Wiecek, *The Opening of American Law: Neoclassical Legal Thought, 1870–1970—Herbert Hovenkamp*, 33 L. & HIST. REV. 1017, 1018 (2015) (book review) (describing how pioneering economists such as William Stanley Jevons conceived of economic relationships in terms of the rational actor).

[30] *See* Korobkin & Ulen, *supra* note 15, at 1063.

[31] *Id.*

people process information.[32] The theory assumes that actors will be able to perfectly process all available information and accurately discern the utility-maximizing choice.[33] A chief advantage of rational choice theory is its relative simplicity, which facilitates its application in a variety of legal contexts.[34]

Consider, for example, how the notion of the rational actor informs the general deterrence model of criminal punishment. According to the simplest neoclassical law and economics version of the model, John, a hypothetical, rational citizen contemplating a criminal act, will balance the utility he expects to gain from his transgression against the disutility he will experience if caught and punished, weighted by the probability of being caught.[35] The straightforward (in theory, if not in practice) goal of the criminal justice system under this model is to administer punishments unpleasant enough and frequent enough to tip John's cost-benefit analysis in favor of lawful behavior.[36]

Making use of economic models that incorporate the presumption of rational choice, law and economics scholars have achieved great successes in the major legal disciplines.[37] But after the low-hanging fruit of the law and economics approach was largely gathered in,[38] scholars began arguing that the time was ripe for moving beyond rational choice theory's simplified assumptions about human motivations and cognitive capacities. In 1989, for example, Robert Ellickson asserted that it was time to "enrich" the simplified rational actor model with insights from psychology and sociology about the complexity of human behavior.[39] Ellickson pointed out that, by that time, the assumptions of rational choice theory had long been known to be incorrect (or

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[32] *See* Robert C. Ellickson, *Bringing Culture and Human Frailty to Rational Actors: A Critique of Classical Law and Economics*, 65 CHI.-KENT L. REV. 23, 23 (1989).

[33] *Id.*

[34] *Id.* at 24.

[35] Jolls et al., *supra* note 1, at 1538; Richard A. Posner, *Bentham's Influence on the Law and Economics Movement,* 51 CURRENT LEGAL PROBS. 425, 431 (1998).

[36] *See* David Dolinko, *Three Mistakes of Retributivism*, 39 UCLA L. REV. 1623, 1626 (1992) (discussing deterrence).

[37] *See* Ellickson, *supra* note 32, at 24 (stating in 1989 that "[t]he first generation of law and economics scholars has essentially accomplished the straightforward applications of the basic economic model in virtually every field"); Epstein, *supra* note 1, at 1170–71 (speaking of the "enormous and rapid advances in the field, which had much virgin territory to conquer," and the application of law and economics models to "legal and policy questions of major importance"); Korobkin & Ulen, *supra* note 15, at 1053–54 ("The [law and economics] movement's vast initial successes were so sweeping that the current pliers of the trade have been forced to search for more narrow niches to fill.").

[38] *See* references cited *supra* note 37.

[39] Ellickson, *supra* note 32, at 23. As Ellickson points out, Arthur Leff made the same argument fifteen years earlier, in 1974. Arthur Allen Leff, *Economic Analysis of Law: Some Realism About Nominalism*, 60 VA. L. REV. 451, 470–77 (1974). But Ellickson asserts that Leff's argument, if correct, was premature due to the value to be gained from the simplified rational choice model. Ellickson, *supra* note 32, at 24. In 1989, Ellickson's view is that this value has largely been attained, and that it is now time to revisit Leff's argument. *Id.* at 24–25.

at least incomplete)[40] and argued that more realistic models of human behavior could enhance both the "explanatory power and normative punch" of neoclassical economic models.[41]

B. *Bounded Rationality*

Christine Jolls, Cass Sunstein, and Richard Thaler responded to Ellickson's call for added realism in the law and economics methodology. In a 1998 article, they pointed to the burgeoning field of behavioral economics and argued for a similar movement in legal analysis—a law and behavioral economics approach.[42] Their article builds on the foundational behavioral work of Daniel Kahneman and Amos Tversky (which itself grew from the earlier ideas of Herbert Simon) identifying ways in which people depart from pure rationality in their decision-making.[43]

Key to Jolls and colleagues' proposition is the concept of "bounded rationality,"[44] a term first coined by Simon.[45] Bounded rationality challenges the major assumptions of rational choice theory. First, it takes issue with the theory's supposition that actors can perfectly process any and all information

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[40] Ellickson, *supra* note 32, at 23.

[41] *Id.* Ellickson's proposition was not without its detractors. Most notably, Ellickson points to Richard Posner, a champion of the law and economics approach. *Id.* Throughout the 1980s, Posner insisted that the continued use of neoclassical law and economics' simplified assumptions was warranted and that psychology had not done much to enrich legal analysis. *Id.* at 24; *see also* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 15–16 (3d ed. 1986) (arguing for the continued viability of rational choice theory's simplified assumptions); Richard A. Posner, *The Decline of Law as an Autonomous Discipline: 1962–87*, 100 HARV. L. REV. 761, 769 (1987) (arguing that psychology and sociology had not realized their promise to "improve[] our understanding of law").

[42] Jolls et al., *supra* note 1, at 1474.

[43] *See id.* at 1477; Joshua D. Wright & Douglas H. Ginsburg, *Behavioral Law and Economics: Its Origins, Fatal Flaws, and Implications for Liberty*, 106 NW. U. L. REV. 1033, 1037–39 (2012). For examples of Kahneman and Tversky's foundational literature, see Daniel Kahneman et al., *Experimental Tests of the Endowment Effect and the Coase Theorem*, 98 J. POL. ECON. 1325 (1990); Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263 (1979) [hereinafter Kahneman & Tversky, *Prospect Theory*]; Daniel Kahneman & Shane Frederick, *Representativeness Revisited: Attribute Substitution in Intuitive Judgment*, *in* HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 49 (Thomas Gilovich et al. eds., 2002); Amos Tversky & Daniel Kahneman, *Availability: A Heuristic for Judging Frequency and Probability*, 5 COGNITIVE PSYCHOL. 207 (1973); Tversky & Kahneman, *supra* note 13. For examples of Simon's work, see Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 Q. J. ECON. 99 (1955); Herbert A. Simon, *Rational Decision Making in Business Organizations*, 69 AM. ECON. REV. 493 (1979).

[44] Jolls et al., *supra* note 1, at 1477–78.

[45] *See* NICOLAI J. FOSS & PETER G. KLEIN, ORGANIZING ENTREPRENEURIAL JUDGMENT: A NEW APPROACH TO THE FIRM 232 (2012) (quoting Simon for the proposition that "boundedly rational agents experience limits in formulating and solving complex problems and in processing (receiving, storing, retrieving, transmitting) information").

that comes their way.[46] Instead, bounded rationality theory proposes that real people are limited in their cognitive abilities: that they attend selectively (rather than comprehensively) to information inputs, that they remember imperfectly the information they do take in, and that they are subject to biases when they process this information in the course of decision-making.[47]

Behavioral research has shown that these cognitive limitations can lead to systematic errors in judgments relevant to utility calculations.[48] To return to our aspiring criminal John, for instance, it is likely that he, like the rest of us, suffers from "present bias," a tendency to discount future consequences and give undue weight to present rewards.[49] John's bias has obvious consequences for the general deterrence model of punishment. Specifically, he will tend to overestimate the benefits and underestimate the costs of crime, making it more likely that he will choose to commit a crime where a purely rational actor would not.[50] For the general deterrence model to work as expected, then, we need to take John's bounded rationality into account in deciding the appropriate duration and frequency of punishment.[51] Likewise, additional empirically documented biases and heuristics have implications for myriad other legal theories initially built on a foundation of absolute rationality.[52]

The discussion to this point suggests that even if individuals want to choose the option that will maximize their own utility, they may be unable, due to cognitive limitations, to discern what the utility-maximizing choice is.[53] The present bias, for example, may (mis)lead John to underestimate the disutility he

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[46] Jolls et al., *supra* note 1, at 1477.

[47] *See, e.g.*, Bruce Chapman, *Rational Choice and Categorical Reason*, 151 U. PA. L. REV. 1169, 1170 (2003); Jolls et al., *supra* note 1, at 1477–78; Korobkin & Ulen, *supra* note 15, at 1075–83; Fred S. McChesney, *Behavioral Economics: Old Wine in Irrelevant New Bottles?*, 21 SUP. CT. ECON. REV. 43, 51 (2014).

[48] Korobkin & Ulen, *supra* note 15, at 1085.

[49] Jolls et al., *supra* note 1, at 1538–39.

[50] *See, e.g.*, Paul H. Robinson & John M. Darley, *Does Criminal Law Deter? A Behavioral Science Investigation*, 24 OXFORD J. LEGAL STUD. 173, 174 (2004); William Spelman, *The Severity of Intermediate Sanctions*, 32 J. RES. CRIME & DELINQ. 107, 113 (1995) (reporting that criminal offenders judged a five-year sentence to be only twice as negative as a one-year sentence).

[51] *See* Posner, *supra* note 35, at 431.

[52] *See, e.g.*, Deven R. Desai, *Bounded by Brands: An Information Network Approach to Trademarks*, 47 U.C. DAVIS L. REV. 821, 828 (2014) (applying the insights of bounded rationality to trademark law); Russell Korobkin, *Bounded Rationality, Standard Form Contracts, and Unconscionability*, 70 U. CHI. L. REV. 1203, 1206 (2003) (examining how bounded rationality bears on various contract doctrines); Gregory Mitchell, *Mapping Evidence Law*, 2003 MICH. ST. L. REV. 1065, 1082 (2003) (discussing the implications of bounded rationality for evidence law); Cass R. Sunstein, *Boundedly Rational Borrowing*, 73 U. CHI. L. REV. 249, 250 (2006) (analyzing borrowing law and policy in light of bounded rationality insights); Avishalom Tor, *The Fable of Entry: Bounded Rationality, Market Discipline, and Legal Policy*, 101 MICH. L. REV. 482, 560 (2002) (discussing the implications of bounded rationality for market entry analyses).

[53] Korobkin & Ulen, *supra* note 15, at 1077.

will experience from punishment, and commit a crime when it is not in his best interest to do so.[54]

But bounded rationality also challenges rational choice theory's other major assumption: that individuals able to discern the utility-maximizing option will, when given the choice, invariably choose this route.[55] In fact, as Jolls and colleagues explain (again drawing from the work of Kahneman, Tversky, and others), actors often do not choose the utility-maximizing option for a variety of reasons.[56]

Kahneman and Tversky's prospect theory, a prominent alternative to expected utility theory, for instance, explains how reference points matter: people make decisions based on the expected outcome relative to a starting reference point rather than on the absolute utility or disutility of the outcome.[57] If John's starting point is destitution, for example, he may value the gains to be had from robbing a bank much more highly than someone who lives in relative comfort, though the absolute gains remain the same for each person.[58]

Individuals may also engage in "satisficing" behaviors, intentionally opting not to seek additional relevant information that would help them discern the utility-maximizing choice, and instead settling for a satisfactory (but not optimal) course of action.[59] They may be constrained from following what they know to be the utility-maximizing route by their own limited willpower.[60] And behavioral work has shed light on other biases and effects showing how we frequently make decisions for reasons other than utility-maximization.[61] Examples include emotional effects (where decisions are made for emotional rather than intellectual reasons),[62] impulse effects (where clearly suboptimal

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[54] *See* Robinson & Darley, *supra* note 50, at 179–80.

[55] Jolls et al., *supra* note 1, at 1477–78.

[56] *Id.*

[57] Christine Jolls & Cass R. Sunstein, *Debiasing Through Law*, 35 J. LEGAL STUD. 199, 205 (2006) (discussing prospect theory); Kahneman & Tversky, *Prospect Theory*, *supra* note 43, at 277.

[58] *See* Kahneman & Tversky, *Prospect Theory*, *supra* note 43, at 277 ("An essential feature of [prospect] theory is that the carriers of value are changes in wealth or welfare, rather than final states.").

[59] Korobkin & Ulen, *supra* note 15, at 1075–77. The concept of satisficing was also introduced by Herbert Simon, Herbert A. Simon, *Theories of Decision-Making in Economics and Behavioral Science*, 49 AM. ECON. REV. 253, 262–65 (1959), and has since been validated empirically. *See* Barry Schwartz et al., *Maximizing Versus Satisficing: Happiness Is a Matter of Choice*, 83 J. PERSONALITY & SOC. PSYCHOL. 1178, 1178 (2002); Itamar Simonson & Aner Sela, *On the Heritability of Consumer Decision Making: An Exploratory Approach for Studying Genetic Effects on Judgment and Choice*, 37 J. CONSUMER RES. 951, 951, 956 (2011).

[60] Jolls et al., *supra* note 1, at 1479 (giving the example of a person who would rather not smoke, but is prevented by her own limited willpower from stopping).

[61] *See* McChesney, *supra* note 47, at 49–50.

[62] *Id.* at 49.

decisions are made on impulse),[63] and the status-quo bias (where actors prefer the status quo even when a low-cost change would enhance utility).[64]

One way to characterize the major advance of behavioral law and economics is its recognition of how seemingly irrelevant variables affect decision-making.[65] According to rational choice theory, factors like the way in which a decision is framed, a decision-maker's reference point, or how she is feeling at the time of a choice simply have no bearing on the path the decision-maker will take: they are irrelevant to the utility-maximization calculation.[66] Behavioral law and economics, in contrast, recognizes that these types of factors do influence decision-making and has begun to characterize precisely how they do so.[67]

According to Jolls, Sunstein, and Thaler, bounded rationality should be used as a basis for more realistic positive descriptions of human behavior and decision-making.[68] Because behavioral experiments show that people depart from rationality in predictable ways due to features of the choice that were previously deemed irrelevant, we can incorporate these departures into models of behavior.[69] And because we are modeling behavior, bounded rationality theory should lead to testable predictions that are either borne out, or not, by behavior in real market situations—behavior that is currently not adequately predicted by the assumptions of conventional economics.[70]

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[63] *Id.*

[64] *Id.*

[65] *See* Goldin, *supra* note 9, at 231 (characterizing the insights of behavioral law and economics as actors making decisions "based on . . . preference-irrelevant feature[s] of the decision").

[66] *See, e.g.*, Korobkin & Ulen, *supra* note 15, at 1069 ("[A]ll but the thinnest versions of rational choice theory assume that decision makers conduct a cost-benefit analysis that is invariant to factors external to their choice . . . ."). *But see* Richard A. Posner, *Rational Choice, Behavioral Economics, and the Law*, 50 STAN. L. REV. 1551, 1551–52 (1998) (stating that neoclassical economic analysis of law "long ago abandoned the model of hyperrational, emotionless, unsocial, supremely egoistic, nonstrategic man (or woman) that [critics] in places appear to ascribe to it" (footnote omitted)).

[67] *E.g.*, Mitchell, *supra* note 6, at 169 (describing how the boundedly rational actor of behavioral law and economics "open[s] himself up to fleeting influences of the situation, such as attention-grabbing information, the manner in which choices are presented, and how filling his breakfast was"); Avishalom Tor, *The Methodology of the Behavioral Analysis of Law*, 4 HAIFA L. REV. 237, 260–63 (2008) (describing how framing, reference points, and loss aversion can influence decision-makers at the point of decision).

[68] Jolls et al., *supra* note 1, at 1478.

[69] *See id.* at 1474 ("The unifying idea in [a behavioral law and economic] analysis is that behavioral economics allows us to model and predict behavior relevant to the law with the tools of traditional economic analysis, but with more accurate assumptions about human behavior . . . .").

[70] *Id.* at 1481–85.

It is probably no exaggeration to say that the behavioral law and economics movement has transformed legal thinking[71]—legal scholars now routinely refer to bounded rationality and rely on other behavioral concepts,[72] and law students are increasingly exposed to these ideas.[73] President Obama even established a Social and Behavioral Sciences Team (SBST) to apply behavioral scientific insights to questions of policy.[74]

But despite its successes, not everyone has accepted behavioral law and economics wholesale. Immediately after publishing their 1998 article, Jolls, Sunstein, and Thaler received pushback in the form of several responses. Predictably, some of this pushback came from neoclassical law and economics scholars. Richard Posner, for example, while conceding that "law can benefit from [the] insights [of behavioral economics],"[75] describes Jolls and colleagues' approach as "ad hoc," and opines that many of their insights are already a part of, or could be handled by, neoclassical law and economics theory.[76] A second notable response at the other end of the spectrum came from Mark Kelman, who, while not unsympathetic to the ideas motivating behavioral law and economics, cautions that Jolls and colleagues' approach suffers from some of the same shortcomings as neoclassical law and economics.[77] Chief among these shortcomings, according to Kelman, is the authors' failure to recognize that behavioral law and economics, despite its enhanced realism and complexity, is

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[71] *See* Ryan Bubb & Richard H. Pildes, *How Behavioral Economics Trims Its Sails and Why*, 127 HARV. L. REV. 1593, 1595 (2014) ("Behavioral law and economics (BLE) has been broadly regarded in recent years as among the most promising and exciting new developments in public policymaking theory and practice.").

[72] *See* Grant M. Hayden & Stephen E. Ellis, *Law and Economics After Behavioral Economics*, 55 U. KAN. L. REV. 629, 630 (2007) (describing the impact of behavioral economics on legal scholarship); Wright & Ginsburg, *supra* note 43, at 1034–35 (discussing the impact on regulatory policy making).

[73] Maurice E. Stucke, *Foreword: The Rise of Behavioral Economics*, 13 TRANSACTIONS 309, 309–10 (2012).

[74] *About SBST*, SBST, https://sbst.gov/#work [https://perma.cc/752K-QHY5]. The fate of the SBST under the current Trump administration is unclear, but scholars have speculated that it is now defunct. *See* Tiago Mata, *Automatic for the People*, FIRST 100 DAYS (May 4, 2017), http://first100days.stsprogram.org/2017/05/04/automatic-for-the-people/ [https://perma.cc/3T8P-83LC] ("Predictably, [SBST] was an early candidate for Trump's 'you're fired,' and their website now bears the disclaimer that its contents are 'historical material "frozen in time" on January 20, 2017.'").

[75] Posner, *supra* note 66, at 1551.

[76] *Id.* at 1552 ("Some of the insights [Jolls and colleagues] ascribe to behavioral economics are already a part of economic analysis of law . . . . Other points they make are new labels for old challenges to the economic model of behavior . . . ."); *see also* Christine Jolls et al., *Theories and Tropes: A Reply to Posner and Kelman*, 50 STAN. L. REV. 1593, 1593–94 (1998) (replying to Posner's criticisms). For an argument similar to Posner's made over fifteen years later, see McChesney, *supra* note 47, at 46 ("[S]ome of what behavioral economics claims to bring to the table has in fact been on the table for some time, and . . . much of what has been missing from the table is mostly irrelevant.").

[77] Mark Kelman, *Behavioral Economics as Part of a Rhetorical Duet: A Response to Jolls, Sunstein, and Thaler*, 50 STAN. L. REV. 1577, 1578–79 (1998).

still, like neoclassical law and economics, merely an "interpretive trope"—one of many ways to approach a complex and ambiguous data set—rather than a "full-blown verifiable or falsifiable theor[y]."[78]

Additional critiques of behavioral law and economics and bounded rationality theory have emerged over time. Some are grounded in empirical work;[79] others worry about the lack of a "unifying theory" in behavioral law and economics;[80] still others contend that the approach insufficiently accounts for cultural influences on behavior.[81]

Though behavioral law and economics has not been spared its share of scrutiny and critique, the conversation has overlooked a crucial shortcoming of the theory. This is the fact that bounded rationality is not static, nor is it independent of previous policy choices. I address this shortcoming here.

III. MALLEABLE RATIONALITY

The law and behavioral economics movement represents an important advance in our understanding of human decision-making. But it fails to adequately incorporate an important reality: the fact that our brains, and therefore our decision-making capacity, change with experience over time. This insight is grounded in the neuroscientific concept of neuroplasticity. In this Part, I introduce the concept of neuroplasticity and describe how it pertains to positive descriptions of decision-making through the workings of malleable rationality. I then explore three examples from criminal and advertising law that illustrate why it is so crucial that we take the phenomenon of malleable rationality into

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[78] *Id.* at 1579; *see also* Jolls et al., *supra* note 76, at 1605–08 (replying to Kelman's criticisms). In their reply, the authors push back against Kelman's characterization of behavioral law and economics as just one of many available tools for analyzing and interpreting human behavior. *Id.* at 1607. Though admitting that their theory is currently incomplete (pending more empirical research), they express optimism that behavioral law and economics is a theory that will lead to tangible improvements in law and policy. *Id.* at 1608.

[79] *See* Gregory Mitchell, *Why Law and Economics' Perfect Rationality Should Not Be Traded for Behavioral Law and Economics' Equal Incompetence*, 91 GEO. L.J. 67, 76 (2002) (discussing empirical evidence emphasizing the variability and situational dependence of specific irrational behaviors and proposing a middle road between rational choice theory and bounded rationality theory that is more firmly grounded in the empirical literature).

[80] *See* Hubbard, *supra* note 6, at 38–40; *see also* Hayden & Ellis, *supra* note 72, at 630–33 (arguing that the lack of a unified theory leads to inconsistent explanations for behavior and proposing an alternative "top-down" approach that recognizes that people often make decisions based on only a narrow subset of their beliefs); Mitchell, *supra* note 6, at 169 (describing our current understanding of behavioral law and economics as "only a sketch").

[81] *See* Dan M. Kahan et al., *Fear of Democracy: A Cultural Evaluation of Sunstein on Risk*, 119 HARV. L. REV. 1071, 1072–73 (2006) (reviewing CASS R. SUNSTEIN, LAWS OF FEAR: BEYOND THE PRECAUTIONARY PRINCIPLE (2005)). *But see* Cass R. Sunstein, *Misfearing: A Reply*, 119 HARV. L. REV. 1110, 1111 (2006) (replying to Kahan et al. and arguing that what the authors refer to as "cultural cognition" is in fact a product of bounded rationality).

account. If we do not, our positive descriptions of choice behavior will be incorrect, which will in turn lead to suboptimal and at times even counterproductive policy making. We may, for example, enact seemingly unrelated policies that will hinder criminal deterrence efforts. Or we may enact a policy meant to promote consumer autonomy that has precisely the opposite effect.

A. *Theory*

1. *Neuroplasticity*

Neuroplasticity refers to physical changes that take place in the brain over a person's lifetime.[82] These changes may occur on different physiological levels, from alterations in individual brain cells (called neurons), to the growth of new neurons, to changes in connectivity among networks of neurons.[83]

Why and when does neuroplasticity occur? Often, it is precipitated by a person's experience with the outside world.[84] When we learn something new, that learning is reflected in physical changes to the brain.[85] By learning to play the piano, for example, we strengthen particular connections in the brain in regions associated with sensory processing and motor performance.[86]

Perhaps not surprisingly, the brain is at its most plastic when we are young.[87] During this time, the brain is rapidly developing and connections among neurons are alternately forming and being pruned away in accordance with our particular set of experiences.[88] This period of early brain development tapers off in intensity over time and is largely complete by the time a person

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[82] *See* Stahnisch & Nitsch, *supra* note 8, at 589–90 (discussing the definition and origins of the term).

[83] *See id.* at 590 (discussing the phenomenon of "axonal reorganization" (connectivity changes) in the brain); *see also* Bogdan Draganski et al., *Neuroplasticity: Changes in Grey Matter Induced by Training*, 427 NATURE 311, 311–12 (2004) (discussing how juggling training induces neuroplasticity via grey matter (neuronal) and white matter (connectivity) changes in the brain); Gerd Kempermann, *The Pessimist's and Optimist's Views of Adult Neurogenesis*, 145 CELL 1009, 1009 (2011) (discussing how neuroplasticity is manifest through the growth of new neurons).

[84] *See* Draganski et al., *supra* note 83, at 311.

[85] *Id.* at 311–12 (discussing how neuroplasticity occurred when subjects learned a new skill (in this case, juggling)).

[86] *See, e.g.*, Lawrence M. Parsons et al., *The Brain Basis of Piano Performance*, 43 NEUROPSYCHOLOGIA 199, 199–200 (2005) (discussing the neural responses accompanying various musical exercises).

[87] Nandini Mundkur, *Neuroplasticity in Children*, 72 INDIAN J. PEDIATRICS 855, 856 (2005) (noting that "plasticity of the brain is . . . maximal during the critical periods [that occur in youth]"); Ronald L. Simons & Eric T. Klopack, *Invited Address: "The Times They Are A-Changin'" Gene Expression, Neuroplasticity, and Developmental Research*, 44 J. YOUTH & ADOLESCENCE 573, 575–76 (2015) (discussing the empirical evidence supporting neuroplasticity in children).

[88] *See* Mundkur, *supra* note 87, at 855 (discussing the phenomenon of pruning).

reaches early adulthood.[89] After this time, the physical configuration of our brains becomes more stable.[90]

But neuroplasticity, though more attenuated, continues throughout our adult lives as we continue to learn and collect new experiences.[91] Recent research has shown, for example, that adults can grow new neurons, something that was previously thought not to occur.[92] And a striking example of neuroplasticity in adults is seen in those who bounce back from a serious brain injury, like a stroke, that kills brain tissue.[93] The recovery is thought to occur through neural rewiring that allows healthy parts of the brain to take on new functions.[94] If brain tissue originally responsible for moving the right arm is damaged, leading to partial paralysis, for example, the brain may rewire itself to allow another part of the brain to adopt this function and restore movement in the right arm.[95] Though dramatic, this illustration underscores how the adult brain continues to change in response to individualized circumstances and experiences throughout a person's life.

Again, though, less dramatic illustrations of neuroplasticity can be seen every day: every time we commit something to long-term memory, every time we learn a new skill.[96] Every experience that changes us as individuals in a long-lasting way also changes our brains, and is an example of neuroplasticity at work.[97]

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[89] *Id.* at 856.

[90] *Id.*

[91] *Id.* at 856 ("Plasticity of the brain is maximal in [youth], but continues at a reduced rate throughout life.").

[92] *See* Draganski et al., *supra* note 83, at 311 (discussing how changes in grey matter (neurons) occur when adult subjects learn a new skill); Kempermann, *supra* note 83, at 1009 (discussing the phenomenon of adult "neurogenesis" (birth of new neurons)).

[93] *E.g.*, Alan Sunderland & Anna Tuke, *Neuroplasticity, Learning and Recovery After Stroke: A Critical Evaluation of Constraint-Induced Therapy*, 15 NEUROPSYCHOLOGICAL REHABILITATION 81, 81–82 (2005) (discussing rehabilitation techniques that aid stroke recovery through the mechanism of neuroplasticity).

[94] *E.g.*, Shaheen Hamdy et al., *Organization and Reorganization of Human Swallowing Motor Cortex: Implications for Recovery After Stroke*, 99 CLINICAL SCI. 151, 151 (2000) (hypothesizing how areas of the brain may reorganize themselves after stroke to recover previous functionality).

[95] *See id.*; *see also* A. Turton et al., *Contralateral and Ipsilateral EMG Responses to Transcranial Magnetic Stimulation During Recovery of Arm and Hand Function After Stroke*, 101 ELECTROENCEPHALOGRAPHY & CLINICAL NEUROPHYSIOLOGY 316, 316–17 (1996).

[96] *See* Draganski, *supra* note 83, at 311.

[97] Mundkur, *supra* note 87, at 855 ("Neuroplasticity refers to structural and functional changes in the brain that are brought about by training and experience. The brain is the organ that is designed to change in response to experience.").

2. *Malleable Rationality*

Neuroplasticity has implications for models of human behavior and decision-making. Neuroscientists have long understood that decision-making and behavior is orchestrated and dictated to a large extent by our brains.[98] And we know that through the workings of neuroplasticity our experiences—especially those we encounter early in life—alter our brains in ways relevant to future decision-making.[99] It follows, then, that our experiences help determine how, at a later time, our brains process information in the decision-making context. And though *all* experiences are potential sources of neuroplasticity,[100] independent of their source, my focus here is on the experiences we are subjected to collectively, as a result of the laws and policies adopted by our governments.

Person A, with a given set of experiences resulting from a given set of government policies, will have a different brain from a genetically identical *person* B with a dissimilar set of experiences resulting from a different set of policies. Further, these differences will affect their respective decision-making capacities. Though both A and B are boundedly rational in the general sense, they may each be more or less boundedly rational in specific ways—ways that have been dictated by their previous experience, and that have real implications for how they will approach particular decisions in the future. Each person's brain has been molded in a specific way over time as a result of the policies she has lived with. Unlike neoclassical and bounded rationality models, this reflects a *malleable* and *dependent* view of rationality—rationality that changes over time in particular, identifiable, long-lasting ways in response to policy.

The concept of a malleable and dependent rationality departs from both neoclassical and bounded rationality theories in its conception of how decision-making changes over time.[101] To be sure, each of these theories has previously recognized that the decision a person makes at *time* A may differ from the decision he makes at *time* B for various reasons. Neoclassical rational choice theory, for instance, acknowledges that individuals have preferences, and

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[98] *See* CHARLES STANGOR, BEGINNING PSYCHOLOGY 114–33 (2012) (ebook) (discussing the idea that human brains control thoughts, feelings, and behavior).

[99] *See, e.g.*, Eduardo Dias-Ferreira et al., *Chronic Stress Causes Frontostriatal Reorganization and Affects Decision-Making*, 325 SCIENCE 621, 621 (2009) (discussing how brain neuroplasticity caused by stressful life experiences influences later decision-making).

[100] *See, e.g.*, Mundkur, *supra* note 87, at 856–57 (listing visual, audio, and lingual experiences as examples).

[101] The concept of malleable rationality should also be distinguished from the related concept of "time-shifted rationality," introduced by Owen Jones. The theory of time-shifted rationality uses evolutionary biology to explain why observed behaviors that seem irrational in a modern environment are in fact historically rational in the sense that they conferred an evolutionary advantage. Owen D. Jones, *Time-Shifted Rationality and the Law of Law's Leverage: Behavioral Economics Meets Behavioral Biology*, 95 NW. U. L. REV. 1141, 1144–45, 1169–87 (2001) (defining time-shifted reality and providing examples); Jones, *supra* note 7, at 15–17.

that these preferences may change over time.[102] Thus, an individual who makes a decision at *time* A under rational choice theory will do so in a way that maximizes his utility function according to his preferences at *time* A. If his preferences have changed at *time* B, the decision itself may change because his utility function will look different. But one thing that remains constant is the *way* this person makes his decision. Under rational choice theory, he will always make the decision that maximizes his personal utility.[103]

Similarly with bounded rationality theory. The theory recognizes that people's decisions are influenced not only by their preferences at the time of decision-making, but also by irrelevant features of the choice, like the way in which a decision is framed, or the decision-maker's reference point at the time of decision.[104] Just like preferences, these irrelevant features might not (and in fact likely will not) be constant from one point in time to the next. Thus, we might expect a person's actual choice to differ between *time* A and *time* B depending on the quantity and quality of irrelevant features present.[105] What remains constant under bounded rationality theory, however, is the actor's basic decision-making capacity.[106] He is boundedly rational in a static sense, and will always be influenced by irrelevant features of the choice (whichever happen to be present at the time) in the way bounded rationality theory identifies.[107]

In contrast, what malleable rationality proposes is not just that an actor may select a different option at *time* B than he would have at *time* A, either because his preferences or features of the choice have changed. Instead, malleable

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[102] *See, e.g.*, Andreou, *supra* note 11 (describing the "dynamic choice problem" wherein people are imperfect at predicting their future preferences).

[103] *See* Posner, *supra* note 35, at 431 (describing the utility calculation).

[104] *See, e.g.*, Goldin, *supra* note 9, at 231 (characterizing the insights of behavioral law and economics as actors making decisions "based on . . . preference-irrelevant feature[s] of the decision").

[105] *See, e.g.*, Tor, *supra* note 67, at 306–14 (describing how the same decision-maker may employ different decision-making strategies based on the content of the decision-making domain and the context in which the decision occurs). Boundedly rational actors may also explicitly rely on their previous experiences when making a decision. This recognition has given rise to the "decisions from experience" literature in bounded rationality. *See* Ralph Hertwig et al., *Decisions from Experience and the Effect of Rare Events in Risky Choice*, 15 PSYCHOL. SCI. 534, 535–37 (2004) (explaining decisions from experience theory and exploring how decisions made from experience may lead to the underweighting of rare events). But this literature does not propose, as I do here, that decision-makers are fundamentally changed on a physiological level by their previous experiences.

[106] Jolls et al., *supra* note 1, at 1477.

[107] This is not to say, however, that the deviations from strict rationality behavioral law and economics identifies do not exhibit any variability. Avishalom Tor, for example, points out that bounded rationality exhibits heterogeneity that can depend on the circumstances surrounding the choice. Avishalom Tor, *Understanding Behavioral Antitrust*, 92 TEX. L. REV. 573, 612–14 (2014). Again, though, this is somewhat different from the point I am making: that rationality can be molded by earlier policy choices in long-lasting and predictable ways.

rationality recognizes that the decision-maker himself has changed between these two points in time. And not simply in a fleeting way, such as in how he happens to be feeling in the particular moment, but more permanently, in a way that is driven by his experiences with earlier policies and is reflected in his very capacity for rational decision-making.[108] This more permanent physiological change occurs via the workings of neuroplasticity.[109] Rather than merely being swayed in his decision-making by the preferences of the moment or the features of the choice presented, what malleable rationality recognizes is that an actor is *inherently* more or less rational (or exhibits certain biases to a greater or lesser degree) in certain situations because of previous experiences that physiologically changed him.

Let's return to John to illustrate the principle. In a pure rational actor scenario, John balances the utility he expects to gain from his crime against the disutility he expects to experience from punishment, weighted by the probability of being punished.[110] If his expected utility for committing the crime is greater than his expected disutility arising from punishment, John will commit the crime.[111] This model reflects a static conception of rationality—John has certain preferences at the time he makes his decision, and he uses these preferences to construct his utility function.[112] These preferences might change with time, but John always makes his decision in the same way—by rationally maximizing utility.[113]

In the classic bounded rationality scenario, figuring in John's present bias, ignoring other relevant biases and heuristics, and employing an expected utility model, John's expected disutility will be lower than in the pure rational actor model because John is underestimating the discomfort he will experience in the future.[114] John's cost-benefit analysis will be modified accordingly. Note that although time figures into the bounded rationality equation through future discounting, this is still, like the pure rational actor scenario, a static model. We take John as a generalized boundedly rational person without asking how his previous experiences may have modified his decision-making capacity in relevant ways. At whatever time John makes his decision, we give him the same discount function attributable to his present bias. He is boundedly rational in a static way. Of course, features or circumstances present at one time or another may trigger certain additional biases or heuristics that will affect John's choice.

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[108] *Cf.* Kevin N. Ochsner & James J. Gross, *The Cognitive Control of Emotion*, 9 TRENDS COGNITIVE SCI. 242, 243 (2005) (distinguishing between short-term behavioral emotional regulation and cognitive regulation that is the product of long-term physiological changes to the brain).

[109] *See supra* Part III.A.1.

[110] *See* Posner, *supra* note 35, at 431; Dolinko, *supra* note 36, at 1656 n.145.

[111] *See* Posner, *supra* note 35, at 431.

[112] *Id.*

[113] *Id.*

[114] *See, e.g.*, Robinson & Darley, *supra* note 50, at 179–81; Spelman, *supra* note 50, at 109.

But on a fundamental, physiological level, John remains unchanged, and whatever features are or are not present, John's decision-making will always be affected in the same way by these features.

Enter my proposition—that rationality is in fact malleable and depends on previous policy choices. According to this model, policy decisions we make at *time* A—before John is confronted with the choice to commit a crime—will change John in long-lasting ways that bear on his decision-making capacity at *time* B—our moment of interest.

To this end, imagine that neuroscience and psychology experiments have shown that the brains of people raised in poverty develop in such a way as to make them more susceptible to emotional effects and less able to control impulsive behaviors than the average person—a hypothetical assertion that, as I later explain, turns out to be true.[115] Now imagine that John was raised in poverty in part because the city in which he was raised decided at *time* A—shortly before John was born—to divert funding from anti-poverty programs to law enforcement programs. This earlier policy choice will affect John's decision-making capacity at *time* B, when he is confronted with the choice to commit a crime. Emotional effects and imperfect impulse control are a standard part of the bounded rationality account—we expect even the generalized, hypothetical boundedly rational person to exhibit these effects to some degree.[116] But because of John's earlier policy-driven experience with poverty, an experience that has changed him physiologically in a "sticky" long-lasting way, he will exhibit emotional effects and impaired impulse control to a degree he would otherwise not have exhibited. John himself has changed, and we can predict the direction of that change (from better to worse impulse control) based on neuroscience and psychology experiments showing how poverty affects the brain.[117] Because of the change, John will be more subject to impulse effects than the hypothetical person (even a boundedly rational person) considered in a temporal vacuum.[118] This has implications for how John will make his choice. Specifically, in this case, he will be more likely to succumb to emotional impulse, and less likely to be deterred by the prospect of punishment than we might otherwise predict. If we want to predict how John will respond to a given set of criminal deterrents, we need to understand how the earlier policy choice affected his rationality.

Just as Jolls, Sunstein, and Thaler have argued that bounded rationality should be used as a basis for more realistic models of human behavior and decision-making,[119] I argue here that the malleable nature of rationality, as illustrated with our hypothetical criminal John, should also be taken into account when constructing these models.

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115 *Infra* Part III.B.1.a.

116 *See* McChesney, *supra* note 47, at 49–50.

117 *See infra* Part III.B.1.a.

118 *See infra* Part III.B.1.a.

119 Jolls et al., *supra* note 1, at 1478.

And despite the potential complexity, we can. Malleable rationality is a relevant and workable improvement over existing models of decision-making because we can use empirical work to predict the types of policies that tend to modify the brain and change decision-making capacity in specific ways. We know from neuroscience and psychology research, for instance, that poverty leads to brain changes that in turn lead to increased impulse effects.[120] This is why it is possible to incorporate it into decision-making models. If we know that most of the target population for our criminal deterrence efforts was raised in poverty, we can account for the corresponding heightened impulse effects when predicting how that population will respond to particular deterrence efforts.[121]

In this way, malleable rationality continues in the tradition of bounded rationality. It is possible to incorporate bounded rationality into models of behavior because behavioral experiments show us how people depart from rationality in predictable ways.[122] Similarly here, it is possible to incorporate malleable rationality into models of behavior because behavioral experiments show us how particular policies can affect decision-making capacity over time.[123] Malleable rationality adds a layer of complexity and accuracy to bounded rationality by recognizing that decision-making capacity can be influenced by earlier laws and policies in specific, predictable, and long-lasting ways.

B. *Examples and Applications*

Recognizing the phenomenon of malleable rationality can help us better predict how individuals will react to specific laws and policies. We can then use these insights to direct behaviors in welfare-enhancing ways and avoid unintended consequences.

Here, I work from examples in criminal law and advertising law to illustrate the point. As suggested by the criminal law-based hypotheticals I include throughout the Article, the concept of malleable rationality is particularly relevant to this area. Criminal law is concerned, in part, with deterring certain behaviors;[124] to design it optimally, therefore, we need to understand as accurately as possible how people will respond in real-life situations to various deterrents, and what factors might keep them from responding as anticipated. The examples I present, highlighting the effects of poverty and exposure to violent media on the brain, reveal how policies seemingly unrelated to criminal deterrence in fact have profound implications for this area of law.

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[120] *Infra* Part III.B.1.a.

[121] *Infra* Part III.B.1.a.iii.

[122] *See* Jolls et al., *supra* note 1, at 1474.

[123] *See infra* Part III.B for examples.

[124] *E.g.*, Paul H. Robinson & John M. Darley, *The Role of Deterrence in the Formulation of Criminal Law Rules: At Its Worst When Doing Its Best*, 91 GEO. L.J. 949, 950–51 (2003) (discussing, and then questioning, the preeminent role deterrence plays in the criminal law).

Similarly, advertising law is ideal for elucidating the malleable nature of rationality. Advertising law deals with the regulation of information, and the idea that information access at *time* A can shape our capacity for processing information at *time* B is intuitive. The illustration I present here demonstrates how a policy enacted with the value of consumer autonomy in mind can, through the workings of malleable rationality, unintentionally undermine that very value at a future point in time. It thus presents an additional striking example of how we ignore the malleable nature of rationality at our own peril.

1. *Criminal Law*

The story of U.S. criminal law is a long and fascinating one. Originally imported as common law from Britain,[125] today criminal law is mostly a creature of state statutes.[126] And though there is wide public and scholarly consensus that the choice to have a criminal law is the correct one, there is debate about the precise purposes a criminal justice system should serve[127]—and relatedly, whether our current system in fact serves those purposes.[128]

Some scholars take a purely deontological, retributivist stance on this question.[129] Under this view, the criminal law exists to exact punishment on citizens whose actions society deems to be morally blameworthy in some way.[130] But others assert that in addition to retributivist considerations, the criminal law should also serve utilitarian goals.[131] There is some debate about what these goals should be—whether, for example, the criminal law should

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[125] Stephen Shute, *With and Without Constitutional Restraints: A Comparison Between the Criminal Law of England and America*, 1 BUFF. CRIM. L. REV. 329, 329–30 (1998).

[126] Guyora Binder & Robert Weisberg, Response, *What Is Criminal Law About?*, 114 MICH. L. REV. 1173, 1180 (2016).

[127] *See, e.g.*, Douglas Husak, *Why Criminal Law: A Question of Content?*, 2 CRIM. L. & PHIL. 99, 99 (2008); Kent Greenawalt, *Punishment*, *in* 3 ENCYCLOPEDIA OF CRIME AND JUSTICE 1282, 1284–92 (Joshua Dressler ed., 2d ed. 2002) (describing the purposes of punishment); Mary Graw Leary, *The Third Dimension of Victimization*, 13 OHIO ST. J. CRIM. L. 139, 139, 141–43 (2015) (discussing "several complementary purposes" of criminal law).

[128] *See, e.g.*, Rose M. Brewer & Nancy A. Heitzeg, *The Racialization of Crime and Punishment: Criminal Justice, Color-Blind Racism, and the Political Economy of the Prison Industrial Complex*, 51 AM. BEHAV. SCIENTIST 625, 628–30 (2008) (critiquing the criminal justice system through the lens of critical race theory); Husak, *supra* note 127, at 99–100 (questioning how the criminal justice system can succeed in the absence of a clear purpose); Leary, *supra* note 127, at 139–40 (critiquing the criminal justice system as outdated due to technological advances).

[129] *E.g.*, Aaron Xavier Fellmeth, *Civil and Criminal Sanctions in the Constitution and Courts*, 94 GEO. L.J. 1, 19–26 (2005) (discussing theories of retribution in the criminal law).

[130] *Id.*

[131] *See, e.g.*, Benjamin L. Apt, *Do We Know How To Punish?*, 19 NEW CRIM. L. REV. 437, 453–55 (2016) (discussing the leading utilitarian theories of criminal punishment).

deter wrongdoing,[132] incapacitate those who are a danger to society,[133] rehabilitate those who have engaged in antisocial behavior,[134] or some combination of all of these.[135] For purposes of this Article, I focus on the popular stance that the criminal law should serve a deterrent function.[136] At its most basic, the deterrence theory posits that the criminal law, by punishing certain harmful behaviors, will dissuade people who are contemplating these behaviors from engaging in them.[137]

The examples I present here in the criminal law space suggest that the phenomenon of malleable rationality has surprising consequences for the deterrence theory of criminal law. In particular, two seemingly unrelated policies—one related to poverty and one to media exposure—each change our understanding of how populations exposed to these policies will respond in a criminal deterrence scenario.

a. *Criminal Law and Poverty*

As alluded to earlier through our hypothetical criminal John, a group of studies exploring the effects of poverty on the brain illustrates how earlier-enacted and seemingly unrelated policies can influence rationality in ways that bear on criminal decision-making. Scholars have long been aware of the connection between poverty and risk for criminal behavior,[138] but recent research suggests that this association may be partly attributable to changes in decision-making capacity, grounded in physiological changes in the brain, that

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[132] *Id.* at 449–53.

[133] Note, *Selective Incapacitation: Reducing Crime Through Predictions of Recidivism*, 96 HARV. L. REV. 511, 512 (1982) (proposing a selective incapacitation approach wherein those with higher probabilities of recidivism are incarcerated longer for their crimes).

[134] Apt, *supra* note 131, at 458–62.

[135] Tapia v. United States, 564 U.S. 319, 325 (2011) ("These four considerations—retribution, deterrence, incapacitation, and rehabilitation—are the four purposes of sentencing generally, and a court must fashion a sentence 'to achieve the[se] purposes . . . to the extent they are applicable' in a given case." (alteration in original)).

[136] *See* Robinson & Darley, *supra* note 124, at 950–51 (describing deterrence as a "centerpiece of criminal law reform"); *see also* Fellmeth, *supra* note 129, at 26–31 (describing theories of and justifications for deterrence).

[137] Apt, *supra* note 131, at 449–53.

[138] *See* Nathalie E. Holz et al., *The Long-Term Impact of Early Life Poverty on Orbitofrontal Cortex Volume in Adulthood: Results from a Prospective Study over 25 Years*, 40 NEUROPSYCHOPHARMACOLOGY 996, 996 (2015) ("Consistent evidence indicates that poverty is a main determinant [of certain types] of increased . . . aggressive, deceptive, and destructive behaviors toward peers and adults."); Ching-Chi Hsieh & M.D. Pugh, *Poverty, Income Inequality, and Violent Crime: A Meta-Analysis of Recent Aggregate Data Studies*, 18 CRIM. JUST. REV. 182 (1993) (conducting a meta-analysis of previous studies and finding positive correlations between poverty and violent crime, and between income inequality and violent crime); Jack Watson, *Poverty and Crime*, LAWNOW, Feb.–Mar. 2000, at 47 ("Poverty is the mother of crime." (quoting Marcus Aurelius Antoninus, 121–180 C.E.)).

poverty wreaks on affected individuals.[139] This insight leads to behavioral predictions that depart from both neoclassical and bounded rationality models.

i. *Neoclassical Rationality*

According to the neoclassical rationality model of criminal deterrence, a rational actor, before committing to any criminal action, will weigh the costs and benefits of that action and choose the route that promises the greatest expected utility.[140] In order to deter crime under a neoclassical rationality model, then, the task is to ensure that the costs of criminal behavior, generally speaking, outweigh the benefits. Richard Posner sums it up nicely in reviewing Bentham's contribution to the economic foundations of criminal law:

> [A] person commits a crime only if the pleasure he anticipates from the crime exceeds the anticipated pain, or in other words only if the expected benefit exceeds the expected cost; to deter crime, therefore, the punishment must impose sufficient pain that, when added to any other pain anticipated by the criminal, it will exceed the pleasure that he anticipates from the crime . . . .[141]

From this basic premise follow a number of additional conclusions about how the criminal law should be structured. If a potential criminal has a choice among several crimes, for instance, punishments should be structured so that the criminal's cost-benefit analysis steers him towards the least serious crime.[142] And, importantly, if the likelihood of being caught goes down for whatever reason, the severity of punishments should go up to keep the expected cost to the criminal at optimal deterrence levels.[143]

These neoclassical law and economic notions of punishment and deterrence have greatly influenced the criminal law, both in Britain and in the United States.[144] And neoclassical law and economics continues to exert its influence on thinking about this body of law today—deterrence theories in particular.[145] As time has gone on, neoclassical law and economics thinking about criminal law has evolved to embrace more sophisticated economic concepts—the idea of

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[139] *See infra* Part III.B.1.a.iii.

[140] Robinson & Darley, *supra* note 50, at 201; Spelman, *supra* note 50, at 121.

[141] Posner, *supra* note 35, at 431.

[142] *Id.*

[143] *Id.*

[144] *Id.* at 431–32.

[145] *See, e.g.*, William L. Barnes, Jr., Note, *Revenge on Utilitarianism: Renouncing a Comprehensive Economic Theory of Crime and Punishment*, 74 IND. L.J. 627, 631 (1999) ("Of any theory of crime and punishment, that of general deterrence has been the most embraced by law and economics scholars."). *See generally* Neal Kumar Katyal, *Deterrence's Difficulty*, 95 MICH. L. REV. 2385, 2389–419 (1997) (engaging in an economic analysis of criminal deterrence).

preference shaping,[146] for instance, or the notion that criminal law discourages inefficient market bypassing.[147] But the basic idea that punishment inflicts disutility on potential criminals, and thereby discourages them from committing crimes, remains.[148]

ii. *Bounded Rationality*

A number of scholars have discussed the implications of bounded rationality for criminal deterrence models. Jolls, Sunstein, and Thaler, for example, point out that due to the availability heuristic—the tendency for people to judge highly visible events as more probable, regardless of their actual probability—we can increase the perceived expected costs of a crime (and thus achieve greater deterrence) without actually raising the probability of punishment.[149] This could be achieved by making particular instances of punishment more visible: flagging parking violations with large, brightly-colored signs, for example,[150] or increasing the visibility and presence of police officers.[151]

Jolls, Sunstein, and Thaler also posit that due to future discounting—the tendency for people to discount future consequences and give undue weight to present rewards—perceived probability of detection may play a greater role in a criminal's expected cost calculation than severity of punishment, since the perceived cost of additional future years in prison will be heavily discounted.[152] This insight leads them to argue that relatively short but certain punishments may be more effective deterrents than relatively long punishments administered more infrequently.[153] Their argument has been backed up by empirical studies of criminal deterrence showing that sure punishment deters better than severe punishment.[154]

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[146] *See* Kenneth G. Dau-Schmidt, *An Economic Analysis of the Criminal Law as a Preference-Shaping Policy*, 1990 DUKE L.J. 1, 2 (1990) (arguing that criminal law helps shape preferences in socially beneficial ways).

[147] *See* Richard A. Posner, *An Economic Theory of the Criminal Law*, 85 COLUM. L. REV. 1193, 1195 (1985) (arguing that the goal of the criminal law is to discourage inefficient market bypassing).

[148] *See* Barnes, *supra* note 145, at 630–32.

[149] Jolls et al., *supra* note 1, at 1538.

[150] *Id.*

[151] *Id.*

[152] *Id.* at 1538–39.

[153] *Id.* at 1538–40.

[154] *See* Daniel S. Nagin, *Deterrence in the Twenty-First Century*, *in* 42 CRIME & JUSTICE IN AMERICA, 1975–2025, at 199, 199 (Michael Tonry ed., 2013) ("The evidence in support of the deterrent effect of the certainty of punishment is far more consistent than that for the severity of punishment . . . . [C]ertainty of apprehension, not the severity of the ensuing legal consequence, is the more effective deterrent.").

Matthew Haist additionally argues that motivated reasoning,[155] optimism bias,[156] and the control illusion[157] have implications for criminal deterrence.[158] According to Haist, potential criminals will be overly optimistic about their chances of getting away with the crime or being punished less severely if they are apprehended because of optimism bias, motivated reasoning about how the fact finder will evaluate their moral culpability, and the illusion that they can somehow influence the fact finder to be lenient in their particular situation.[159] Rather than propose solutions to these behavioral glitches in the neoclassical general deterrence model, Haist takes the position that they will inevitably lead to under-deterrence and are thus fatal to the theory.[160]

Elena Kantorowicz-Reznichenko has observed that in accordance with bounded rationality principles, people are "ambiguity averse": they tend to avoid choice scenarios that make it difficult to assess risk.[161] She thus suggests that deterrence efforts be structured so that potential criminals have a hard time estimating their risk of being caught.[162] The hope, of course, is that faced with this ambiguity, potential criminals will simply opt out of committing crimes altogether.[163] Kantorowicz-Reznichenko makes some practical suggestions in this vein, including the use of random police patrols and the enhanced (and publicized) use of undercover officers.[164]

Finally, it has been observed that bounded willpower, a bounded rationality concept related to impulse effects,[165] may hinder people from responding to

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[155] Matthew Haist, Comment, *Deterrence in a Sea of "Just Deserts": Are Utilitarian Goals Achievable in a World of "Limiting Retributivism"?*, 99 J. CRIM. L & CRIMINOLOGY 789, 811–12 (2009) (describing the tendency for people to reach the conclusion they want to reach, regardless of the evidence).

[156] *Id.* at 812 (describing the tendency to be unrealistically optimistic about one's own chances of success).

[157] *Id.* at 813–14 (describing the illusion that one is the true cause of events that are simply random).

[158] *Id.* at 811–15; *see also* Richard H. McAdams & Thomas S. Ulen, *Behavioral Criminal Law and Economics*, *in* 3 CRIMINAL LAW AND ECONOMICS 403, 417–18 (Nuno Garoupa ed., 2d ed. 2009) (discussing the implications of optimism bias for criminal deterrence).

[159] Haist, *supra* note 155, at 814–16.

[160] *Id.* at 816.

[161] Elena Kantorowicz-Reznichenko, *Any-Where Any-Time: Ambiguity and the Perceived Probability of Apprehension*, 84 UMKC L. Rev. 27, 35 (2015).

[162] *Id.* at 35–38.

[163] *See id.*

[164] *Id.* at 39–41.

[165] Although bounded willpower could technically be classified differently from other aspects of bounded rationality because it focuses more on volitional, rather than purely cognitive, processes, Jolls, Sunstein, and Thaler treat it as an aspect of the larger category of systematic bounds on conventional economic choice models. Jolls et al., *supra* note 1, at 1476–77, 1479. Since volition itself, like cognition, is a physiological phenomenon that is mediated to a substantial degree by the brain, *see, e.g.*, Marcel Brass et al., *Imaging Volition:*

criminal deterrents as expected.[166] The idea is that actors can, in some cases, be swayed by an impulse to satisfy an immediate need that threatens or overwhelms their ability to make choices that are in their long-term best interest.[167]

iii. *Malleable Rationality*

The implications of malleable rationality for criminal deterrence are fundamentally different from those of bounded rationality. The insight is not simply that individuals are boundedly rational and that this will have implications for neoclassical criminal deterrence models in the ways identified by scholars working in this vein. Instead, the phenomenon of malleable rationality suggests that an earlier and seemingly unrelated policy decision can affect governed individuals in ways that initiate long-lasting changes in these individuals' capacity to make choices about criminal behavior. We must understand these changes if we hope to accurately predict how people will approach the decision to commit a crime and calibrate their incentives appropriately.

Here, the relevant, unrelated policy is one of many possible policy choices that results in some subset of the population growing up in poverty. Myriad studies in the neuroscience and psychology literatures suggest that growing up in poverty changes brain and behavior in long-lasting ways relevant to criminal decision-making.[168]

What the Brain Can Tell Us About the Will, 229 EXPERIMENTAL BRAIN RES. 301, 301 (2013), I adopt their classification.

166 *See* DONALD RITCHIE, VICT. SENTENCING ADVISORY COUNCIL, DOES IMPRISONMENT DETER? A REVIEW OF THE EVIDENCE 2 (Apr. 2011) (Austl.), https://uat.sentencingcouncil.vic.gov.au/sites/default/files/publication-documents/Does%20Imprisonment%20Deter%20A%20Review%20of%20the%20Evidence.pdf [https://perma.cc/9ZUY-AUA8] ("Behavioural economic theory proposes that individuals mak[ing] decisions . . . are subject to limits on their willpower.").

167 *See id.*

168 *See* Antoine Bechara et al., *Emotion, Decision Making and the Orbitofrontal Cortex*, 10 CEREBRAL CORTEX 295 (2000) (studying the correlation between emotion, decision-making, and the brain); Aaron D. Boes et al., *Right Ventromedial Prefrontal Cortex: A Neuroanatomical Correlate of Impulse Control in Boys*, 4 SOC. COGNITIVE & AFFECTIVE NEUROSCIENCE 1 (2009) (using neuroscience to predict lack of impulse control); Martha J. Farah et al., *Childhood Poverty: Specific Associations with Neurocognitive Development*, 1110 BRAIN RES. 166 (2006) (examining the impact of poverty on the brain); Jamie L. Hanson et al., *Family Poverty Affects the Rate of Human Infant Brain Growth*, Article in 8 *PLOS One*, PLOS 1 (2013), http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0080954&type=printable [https://perma.cc/E7L6-G2B5] (same); Todd A. Hare et al., *Self-Control in Decision-Making Involves Modulation of the vmPFC Valuation System*, 324 SCIENCE 646 (2009) (discussing the correlation between impulse control and neural activity); Todd F. Heatherton & Dylan D. Wagner, *Cognitive Neuroscience of Self-Regulation Failure*, 15 TRENDS COGNITIVE SCI. 132 (2011) (same); Kimberly G. Noble et al., *Socioeconomic Disparities in Neurocognitive Development in the First Two Years of Life*, 57 DEVELOPMENTAL PSYCHOBIOLOGY 535 (2015) [hereinafter Noble et al.,

Children who grow up in poverty, for instance, show reduced cognitive performance as measured through various metrics like standard IQ tests and school achievement.[169] More specifically, poor kindergarten-aged children have reduced language ability, working memory function, and cognitive control compared to children of higher socioeconomic status.[170] These are long-lasting effects that impact a child throughout his life.[171] Performance gaps observed between high- and low-socioeconomic-status children observed in early youth are exacerbated over time and are widest by the time these children reach adolescence.[172]

The long-lasting nature of these behavioral deficits is unsurprising given their link to differences in brain development between low-socioeconomic-status children and those with more privileged upbringings.[173] The tasks that poor children find difficult—cognitive control, language, and working memory—are handled to a large extent by brain areas known as the prefrontal and executive systems.[174] These very brain areas have been shown to undergo impaired development in low-socioeconomic-status children.[175] One study, for instance, found that young children from low-income families had lower volumes of so-called "gray matter," or critical brain tissue, in prefrontal brain areas necessary for information processing and executive action than their higher-income counterparts.[176] Another revealed that children growing up in homes with annual family incomes below 25,000 U.S. dollars had brains with as much as 6% lower surface area than children from homes with incomes above 150,000 U.S. dollars.[177] The differences in brain structure were greatest in prefrontal and executive brain areas and were correlated with scores on cognitive tests measuring reading and memory ability.[178] At the lowest end of

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Socioeconomic Disparities] (exploring the relationship between socioeconomic status and brain development); Kimberly G. Noble et al., *Family Income, Parental Education and Brain Structure in Children and Adolescents*, 18 NATURE NEUROSCIENCE 773 (2015) [hereinafter Noble et al., *Family Income*] (comparing brain size and gray matter in children and adolescent brains across socioeconomic classes); Ochsner & Gross, *supra* note 108 (studying the psychological and neuroscientific aspects of emotional regulation).

[169] *E.g.*, Farah et al., *supra* note 168, at 166–67; Hanson et al., *supra* note 168, at 2; Noble et al., *Socioeconomic Disparities*, *supra* note 168, at 535.

[170] *See* Farah et al., *supra* note 168, at 168. This particular study tried to rule out as many confounding variables as possible, including overall health and prenatal exposure to harmful substances. *Id.* at 169.

[171] *See* Noble et al., *Socioeconomic Disparities*, *supra* note 168, at 535.

[172] *See id.* at 536.

[173] *Id.* ("[A]chievement is clearly influenced by brain development . . . .").

[174] *See id.*

[175] *See, e.g.*, Farah et al., *supra* note 168, at 166; Hanson et al., *supra* note 168, at 2; Noble et al., *Socioeconomic Disparities*, *supra* note 168, at 535–36.

[176] *See* Hanson et al., *supra* note 168, at 5.

[177] *See* Noble et al., *Family Income*, *supra* note 168, at 776 & fig.2.

[178] *See id.* at 777.

the income scale, differences of a few thousand dollars were correlated with significant changes in brain structure and cognitive ability.[179]

The precise reasons for these strong associations between socioeconomic status, brain development, and cognitive performance are still being investigated. Causal suspects include stress,[180] reduced environmental stimulation through vehicles like toys, books, and adult attention,[181] nutritional differences,[182] or differences in the prenatal environment.[183] Whatever the underlying cause or causes, the results are clear and striking.

But what are their implications for criminal deterrence models? The connection arises through the understanding that brain areas most affected by poverty—prefrontal and executive areas—are the very regions critical for impulse control and executive decision-making.[184] In other words, these are the parts of the brain that help people overcome their emotional impulses and act in more thoughtful, rational ways.[185] If these regions are impaired, we can expect that decision-makers in possession of these brains will be less able than the average person to control the emotional impulses that often lead to criminal behavior.[186] In the language of bounded rationality, they will experience greater "impulse effects" in a decision-making context than we would otherwise expect.[187]

This is not mere conjecture. Studies show that impaired development in the prefrontal and executive brain regions affected by poverty harms people's ability to rein in impulses towards criminal behavior. One review of the scientific literature, for example, concluded that dysfunction in these brain areas leads to increased impulsive aggression and violent behaviors because affected individuals cannot properly regulate their emotions.[188] And a study explicitly

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[179] *See id.* at 774, 777.

[180] *See* Clancy Blair et al., *Salivary Cortisol Mediates Effects of Poverty and Parenting on Executive Functions in Early Childhood*, 82 CHILD DEV. 1970, 1970–75 (2011); Farah et al., *supra* note 168, at 169.

[181] *See* Farah et al., *supra* note 168, at 170.

[182] *See* Noble et al., *Family Income*, *supra* note 168, at 775.

[183] *See id.*

[184] *See* Farah et al., *supra* note 168, at 167; Hanson et al., *supra* note 168, at 5.

[185] *See, e.g.*, Bechara et al., *supra* note 168, at 295; Hare et al., *supra* note 168, at 646; Heatherton & Wagner, *supra* note 168, at 132, 136 (relating self-regulation and impulse control to the prefrontal and executive areas of the brain); Ochsner & Gross, *supra* note 108, at 244 (linking the prefrontal cortex to memory, judgment, and reasoning).

[186] *See* Boes et al., *supra* note 168, at 1 (concluding that their results are "consistent with the notion that" structural and functional measures of prefrontal brain areas predict individual tendencies for impulsivity and vulnerability to behaviors like substance abuse resulting from poor impulse control).

[187] *See* McChesney, *supra* note 47, at 49–50 (describing impulse effects in the bounded rationality context).

[188] Richard J. Davidson et al., *Dysfunction in the Neural Circuitry of Emotion Regulation: A Possible Prelude to Violence*, 289 SCIENCE 591 (2000) (reviewing the empirical literature and concluding that dysfunction in the prefrontal cortex, the brain area primarily responsible for impulse control and executive decision-making, leads to increased

examining the long-term effects of childhood poverty on brain development and antisocial behavior[189] concluded that adults raised in poverty had lower frontal brain area volume and also exhibited increased symptoms of conduct disorder,[190] a behavioral syndrome exhibiting itself through the expression of norm violations, violence, and otherwise antisocial behaviors.[191] A striking case study of a boy with severe structural defects in prefrontal brain areas catalogued his behavioral problems as including "egocentricity, impulsivity, hyperactivity, lack of empathy, lack of respect for authority, impaired moral judgment, an inability to plan ahead, and poor frustration tolerance," leading the researchers to conclude that this area "has a profound contribution to the development of human prosocial behavior."[192]

The upshot is that people's brains can be changed in long-lasting ways that affect their decision-making capacity in a particular legal context—here, criminal law—by preexisting policies that may or may not have an obvious connection to this area. To appropriately calibrate incentives in a given area like criminal law, we must understand how these preexisting policies have affected the rationality profiles of targeted citizens. In this case, due to poverty's influence on brain development, at-risk populations will be subject not just to impulse effects, as we expect of the generalized boundedly rational person.[193] They will be subject also to *systematically greater impulse effects* and will be *systematically less able* to control these impulses and weigh the costs and benefits of criminal behaviors than the average boundedly rational actor.[194]

As I discuss in more detail in Part IV, this insight can help us better understand and describe behaviors among populations of interest. And it can also aid in crafting deterrence policies that actually work, because they are based on a more realistic vision of how and why people make the decision to commit a crime. One option is for policy makers interested in criminal deterrence to address the underlying contributor to heightened impulse effects—poverty—directly. A second option would be to account for these heightened impulse

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impulsive aggression and violent behaviors arising from faulty emotional regulation); *see also* Maren Strenziok et al., *Developmental Effects of Aggressive Behavior in Male Adolescents Assessed with Structural and Functional Brain Imaging*, 6 SOC. COGNITIVE & AFFECTIVE NEUROSCIENCE 2, 2 (2011) ("Reduced [prefrontal] activation was associated with greater aggression indicating its normal function is to exert inhibitory control over aggressive impulses."). At least some of this effect is thought to be mediated by the stress hormone cortisol, which tends to be higher in children of lower socioeconomic status. *See, e.g.*, Blair et al., *supra* note 180, at 1970–75.

189 Holz et al., *supra* note 138, at 996–97.

190 *Id.* at 999.

191 *See id.* at 1001.

192 Aaron D. Boes et al., *Behavioral Effects of Congenital Ventromedial Prefrontal Cortex Malformation*, Article in 11 *BMC Neurology*, BMC 1, 1 (2011), https://bmcneurol.biomedcentral.com/track/pdf/10.1186/1471-2377-11-151?site=bmcneurol.biomedcentral.com [https://perma.cc/W57C-3KYC].

193 *See* Holz et al., *supra* note 138, at 1000–02.

194 *See id.*

effects in a different way—for example, by undertaking interventions in the target population known to counter poverty's effects on rationality and executive function.[195]

My goal here, however, is not to argue that any particular intervention should be adopted. Instead, it's to highlight what both neoclassical and bounded rationality models have to this point failed to appreciate: that the extent to which people display particular biases depends on earlier policy choices. Whatever we might choose to do in this particular scenario, it is our understanding of malleable rationality that helps us identify the underlying interaction in the first place. Once we have identified the effect and its underlying cause, we are in the best possible position to take corrective action.

b. *Criminal Law and Violent Media*

i. *Neoclassical and Bounded Rationality*

As explained above, neoclassical rationality approaches to criminal law focus on deterrence, and assume that potential criminals will be deterred in accordance with a rational analysis of the costs and benefits of committing a crime. And scholars who have approached criminal deterrence from a bounded rationality perspective point out that identified instances of bounded rationality, like the optimism bias and impulse effects, will cause people, in general, to deviate in their response to deterrents from what neoclassical rationality predicts.[196] While some scholars argue that these deviations fatally undermine deterrence efforts, others assert that the insights can be harnessed so as to make attempts at criminal deterrence more effective.[197]

ii. *Malleable Rationality*

Again, the implications of malleable rationality for criminal deterrence go beyond what has previously been proposed by neoclassical and bounded rationality scholars. Because of malleable rationality, we don't simply expect people to exhibit biases in their decision-making, as bounded rationality scholars have already posited. Instead, we expect that people will exhibit identified biases to a greater degree than what we would otherwise predict, or in some cases display new biases, because of previous policies that have modified their capacity for rational decision-making. As already discussed, policies that contribute to childhood poverty lead to long-lasting brain changes

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[195] *See, e.g.*, Julie Markant et al., *Selective Attention Neutralizes the Adverse Effects of Low Socioeconomic Status on Memory in 9-Month-Old Infants*, 18 DEVELOPMENTAL COGNITIVE NEUROSCIENCE 26, 26 (2016) (testing a spatial cueing task in nine-month-old infants and finding that it neutralized the negative effects of low socioeconomic status on memory function).

[196] *See* McChesney, *supra* note 47, at 49–50.

[197] Jolls et al., *supra* note 1, at 1478.

that can influence how affected actors approach the decision to commit a crime.[198] Here, I explore how policies related to violent media exposure can also affect rationality in ways that bear on criminal decision-making.

A number of studies have explored how exposure to certain types of media can change people's brains in ways that could potentially affect their weighing of the costs and benefits of criminal conduct. There is robust consensus, for example, that exposure to violent media desensitizes people to violence and increases aggressive and antisocial behaviors.[199] People so exposed are less likely to show concern over subsequent real-life violence,[200] are more prone to feelings of anger and hostility,[201] are more likely to indulge in aggressive thoughts and behaviors,[202] and are less likely to engage in prosocial and helping behaviors.[203]

While this is true for both children and adults,[204] when the exposure is frequent enough and occurs at a young enough age, the effects can be particularly long-lasting and difficult to overcome.[205] Though exposure to violent images has a larger short-term influence on adults, triggering previously learned attitudes or "behavioral scripts," and leading to increased aggression in

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198 *See supra* Part III.B.1.a.iii.

199 *See* references cited *infra* notes 200–203.

200 Brad J. Bushman & Craig A. Anderson, Research Report, *Comfortably Numb: Desensitizing Effects of Violent Media on Helping Others*, 20 PSYCHOL. SCI. 273, 273 (2009).

201 Craig A. Anderson & Brad J. Bushman, *Effects of Violent Video Games on Aggressive Behavior, Aggressive Cognition, Aggressive Affect, Physiological Arousal, and Prosocial Behavior: A Meta-Analytic Review of the Scientific Literature*, 12 PSYCHOL. SCI. 353, 353 (2001); Craig A. Anderson et al., *Exposure to Violent Media: The Effects of Songs with Violent Lyrics on Aggressive Thoughts and Feelings*, 84 J. PERSONALITY & SOC. PSYCHOL. 960, 960 (2003); Kevin D. Browne & Catherine Hamilton-Giachritsis, Review, *The Influence of Violent Media on Children and Adolescents: A Public-Health Approach*, 365 LANCET 702, 702–03 (2005); Brad J. Bushman & L. Rowell Huesmann, *Short-Term and Long-Term Effects of Violent Media on Aggression in Children and Adults*, 160 ARCHIVES PEDIATRIC & ADOLESCENT MED. 348, 350–51 (2006).

202 Anderson & Bushman, *supra* note 201, at 353; Anderson et al., *supra* note 201, at 960; Browne & Hamilton-Giachritsis, *supra* note 201, at 702–03; Tobias Greitemeyer, *Effects of Prosocial Media on Social Behavior: When and Why Does Media Exposure Affect Helping and Aggression?*, 20 CURRENT DIRECTIONS PSYCHOL. SCI. 251, 251 (2011) (collecting references); Jamie M. Ostrov et al., *Media Exposure, Aggression, and Prosocial Behavior During Early Childhood: A Longitudinal Study*, 15 REV. SOC. DEV. 612, 612 (2006); *see also* Paul Boxer et al., *The Role of Violent Media Preference in Cumulative Developmental Risk for Violence and General Aggression*, 38 J. YOUTH & ADOLESCENCE 417, 417 (2009) (finding that a preference for violent media predicts future violence and general aggression).

203 Anderson & Bushman, *supra* note 201, at 353; Bushman & Anderson, *supra* note 200, at 273; Greitemeyer, *supra* note 202, at 251 (collecting references); Ostrov et al., *supra* note 202, at 612.

204 Bushman & Huesmann, *supra* note 201, at 348.

205 *See id.*; Ostrov et al., *supra* note 202, at 612; *see also* Boxer et al., *supra* note 202, at 417 (finding that preference for violent media in young people helps predict future violence and general aggression).

the short-term,[206] the long-term effects of such exposure are much greater for children.[207] When children are repeatedly[208] exposed to violent media, the experience contributes to new learning and the formation of new behavioral scripts—scripts that privilege aggressive and angry thoughts and feelings over helpful behavior—that can last a lifetime.[209] These scripts are encoded by physiological changes in the child's malleable and developing brain, and, unless modified while the brain is still developing, will likely stay there.[210]

As with the research on poverty, the findings about the impacts of violent media on behavior have been linked to activity in specific areas of the brain important for self-control and executive functioning. One study, for instance, found that those repeatedly exposed to violent media showed decreased activity in brain regions associated with the ability to control a range of emotional impulses, including aggressive tendencies.[211] Another determined that this exposure decreased activity in another brain region involved in executive control and emotion regulation.[212] Violent media exposure also leads to *increased* activity in brain regions necessary for making and carrying out aggressive plans.[213]

The neuroscientific evidence that violent media exposure leads to long-term changes in the brain is less robust than the literature linking poverty to lasting brain changes. But the consensus that violent media has long-term impacts on aggressive *behaviors*,[214] along with the traditional neuroscientific

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[206] Bushman & Huesmann, *supra* note 201, at 349–51.

[207] *Id.* at 348.

[208] Repetition is an important precursor to learning and the physiological changes that mediate this learning. *See id.*

[209] *Id.* at 349–50.

[210] *See id.* at 349 (speaking to the "encoding" of specific behaviors); John P. Murray, *Media Violence: The Effects Are Both Real and Strong*, 51 AM. BEHAV. SCI. 1212, 1212 (2008) ("The changes in aggression are both short term and long term, and these changes may be mediated by neurological changes in the young viewer."). *See generally* Justin W. Collins, *The Neuroscience of Learning*, 39 J. NEUROSCIENCE NURSING 305 (2007) (reviewing the scientific literature explaining the neurophysiological basis of learning). This is not to say that adult brains exhibit no plasticity at all (or, in other words, that adults are incapable of behavioral change). But it is much more difficult for adults to change behavioral patterns and schemas learned as youth, precisely because their brains are less malleable than they were as children. *See supra* Part III.A.1.

[211] Christopher R. Kelly et al., *Repeated Exposure to Media Violence is Associated with Diminished Response in an Inhibitory Frontolimbic Network*, Article in 12 *PLOS One*, PLOS 1 (2007), http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0001268 [https://perma.cc/7EGC-6TZC].

[212] Nicholas L. Carnagey et al., *Media Violence and Social Neuroscience*: *New Questions and New Opportunities*, 16 CURRENT DIRECTIONS PSYCHOL. SCI. 178, 180 (2007).

[213] *Id.* at 178–80.

[214] *See, e.g.*, Murray, *supra* note 210, at 1212.

understanding that behavior is the output of brain function,[215] has led many neuroscientists to hypothesize that the lasting behavioral changes are mirrored by durable changes in relevant brain regions,[216] changes we see in response to violent media exposure in the short term.[217]

These findings have implications for criminal deterrence models. The evidence suggests that repeated exposure to violent media results in both long- and short-term increases in violent and aggressive behavior, and that at least the short-term effects can be correlated with changes in brain activity in regions associated with emotional control.[218] Though a direct link between violent media exposure and criminal behavior has not been established,[219] what is clear is that the brains of people exposed to such media are changed in ways that bear on their ability to make a rational choice about criminal behavior.[220] Because this exposure downregulates activity in areas of the brain responsible for controlling aggressive and emotional impulses, we can expect those so exposed to be less able than the average person to control the emotional impulses that often precede violent and criminal behavior.[221] Similar to the effects of poverty on decision-making, those with repeated exposure to violent media will experience bounded rationality's "impulse effects" to a greater extent than we would otherwise expect in a criminal decision-making context.[222]

This, again, underscores the fact that malleable rationality is a phenomenon that should be accounted for when describing the decision-making capabilities citizens display in any given policy situation. Here, it tells us that the decision-making capacity of potential criminals will be modified in relevant ways by policies regulating the production and distribution of violent media. This insight will help us gain a more accurate understanding of how people approach the decision to commit a crime.

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[215] *See* Collins, *supra* note 210, at 305–07 (describing the "neurophysiological basis of learning" as an interaction between neurons and observed activity that is committed to long-term memory).

[216] *See, e.g.*, Bushman & Huesmann, *supra* note 201, at 349 (discussing how long-term behavioral changes in aggression are "encoded" in the brain); Murray, *supra* note 210, at 1224–25.

[217] Kelly et al., *supra* note 211, at 1, 4; *see also* Carnagey et al., *supra* note 212, at 180.

[218] *See* Kelly et al., *supra* note 211, at 4.

[219] Browne & Hamilton-Giachritsis, *supra* note 201, at 704, 708; *see also* Joanne Savage, *Does Viewing Violent Media Really Cause Criminal Violence? A Methodological Review*, 10 AGGRESSION & VIOLENT BEHAV. 99, 125 (2004).

[220] *See, e.g.*, Bruce D. Bartholow et al., *Chronic Violent Video Game Exposure and Desensitization to Violence: Behavioral and Event-Related Brain Potential Data*, 42 J. EXPERIMENTAL SOC. PSYCHOL. 532, 537 (2006).

[221] *See* Boes et al., *supra* note 168, at 1 (concluding that their results are "consistent with the notion that" structural and functional measures of prefrontal brain areas predict individual tendencies for impulsivity and vulnerability to behaviors like substance abuse resulting from poor impulse control).

[222] *See* McChesney, *supra* note 47, at 49 (describing impulse effects in the bounded rationality context).

Appreciating the underlying policies that modify criminal decision-making in a targeted population can also help us determine how to best deter crime. This might mean tackling these policies directly in the service of crime deterrence, for example, by enacting regulations that make it more difficult for young viewers in particular to access violent media. Or it might mean that we simply account for these effects in devising alternative solutions: if we live in a world where violent media exposure begins early and is frequent, we should recognize that people, in the general case, will be more prone to impulse effects than in a hypothetical baseline world. To deter crime appropriately we will therefore need to account for these effects through "debiasing"—the use of behavioral economic principles to counter socially undesirable biases[223]—or other creative approaches. But the primary takeaway is that malleable rationality profoundly affects our formation of effective policy.

I reiterate here that my goal is not to advocate any particular policy intervention. Rather, it's to elucidate how earlier policy decisions, through the workings of malleable rationality, can permanently change the extent to which people display particular biases. We need to appreciate this point before we can properly implement the insights of bounded rationality.

2. *Advertising Law*

Advertising law—defined here as the two interrelated areas of Federal Trade Commission (FTC) advertising regulation and trademark law—is guided by a single overarching value: facilitating consumer choice and autonomy.[224] Here, I show that a policy enacted with this value in mind—specifically, an FTC policy limiting the regulation of advertising directed towards children—might, due to the unanticipated long-term effects of this policy on the decision-making capacity of its targets, actually undermine this value by interfering with the future ability of consumers to exercise choice and autonomy in a meaningful way. This not only has normative consequences, but also arguably undercuts the doctrinal and theoretical foundation of advertising law itself. The fact that this major consequence flows from one well-meaning policy decision that fails to consider malleable rationality underscores the importance of taking this phenomenon into account.

The FTC, as a consumer protection agency,[225] has broad authority to prevent both "unfair" and "deceptive" acts and practices in the interstate marketplace.[226] The agency takes its mission seriously and has interpreted its broad mandate to include the regulation of unfair, false, and misleading

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[223] *See* Jolls & Sunstein, *supra* note 57, at 199–203.

[224] *See infra* notes 240, 262 and accompanying text.

[225] *Protecting Consumers*, FED. TRADE COMMISSION, https://www.ftc.gov/news-events/media-resources/truth-advertising/protecting-consumers [https://perma.cc/G9K6-KR5M].

[226] 15 U.S.C. § 45(a)(1) (2012).

advertising.[227] It fulfills its mandate through a combination of rulemaking, enforcement actions, consumer education, and policy guidance.[228] The FTC has exercised its authority in the past to regulate a range of advertising practices, including false environmental claims (so-called "greenwashing"),[229] health and fitness claims,[230] deceptive marketing of gift cards,[231] and funeral service provider advertising.[232]

In contrast to the FTC's regulation of advertising, trademark law is an intellectual property regime designed to serve various goals. A trademark is a

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[227] *The Consumer and Federal Regulation of Advertising*, 53 HARV. L. REV. 828, 834 (1940); Robert Pitofsky, *Beyond Nader: Consumer Protection and the Regulation of Advertising*, 90 HARV. L. REV. 661, 680–86 (1977).

[228] Michael Grynberg, *More than IP: Trademark Among the Consumer Information Laws*, 55 WM. & MARY L. REV. 1429, 1438–39 (2014); *Protecting Consumers*, *supra* note 225.

[229] *See, e.g.*, Press Release, Fed. Trade Comm'n, FTC Sends Warning Letter About Green Certification Seals (Sept. 14, 2015), https://www.ftc.gov/news-events/press-releases/2015/09/ftc-sends-warning-letters-about-green-certification-seals [https://perma.cc/WUX3-W6CF]; Press Release, Fed. Trade Comm'n, FTC Announces Actions Against Kmart, Tender and Dyna-E Alleging Deceptive 'Biodegradable' Claims (June 9, 2009) [hereinafter Greenwashing Press Release], https://www.ftc.gov/news-events/press-releases/2009/06/ftc-announces-actions-against-kmart-tender-dyna-e-alleging [https://perma.cc/KY4L-57MD].

[230] *See, e.g.*, Press Release, Fed. Trade Comm'n, Marketers of Simple Pure Supplements Settle FTC Court Action (May 3, 2016) [hereinafter Health Press Release], https://www.ftc.gov/news-events/press-releases/2016/05/marketers-simple-pure-supplements-settle-ftc-court-action [https://perma.cc/G7BA-3HWS]; Press Release, Fed. Trade Comm'n, FTC Approves Final Order Prohibiting "Ultimeyes" Manufacturer from Making Deceptive Claims that the App Can Improve Users' Vision (Feb. 23, 2016), https://www.ftc.gov/news-events/press-releases/2016/02/ftc-approves-final-order-prohibiting-ultimeyes-manufacturer [https://perma.cc/KC3V-A93F].

[231] *See, e.g.*, Press Release, Fed. Trade Comm'n, Kmart Settles with FTC over Gift Card Sales Practices (Mar. 12, 2007) [hereinafter Gift Card Press Release], https://www.ftc.gov/news-events/press-releases/2007/03/kmart-settles-ftc-over-gift-card-sales-practices [https://perma.cc/4X6U-UHL2].

[232] The FTC promulgated the so-called "Funeral Rule" in 1984 to regulate advertising by funeral service providers. The Funeral Rule requires funeral service providers to provide a number of disclosures to consumers, including itemized pricing information. *See* FED. TRADE COMM'N, COMPLYING WITH THE FUNERAL RULE 1 (Apr. 2015), https://www.ftc.gov/system/files/documents/plain-language/pdf-0131-complying-with-funeral-rule_0.pdf [https://perma.cc/2E43-TG45].

signifier[233] that designates the source of a good or service.[234] Owners of trademarks acquire rights in their marks by using these marks in commerce to identify their products.[235] Once acquired, these rights empower mark owners to prohibit uses of their marks (or similar marks) that might confuse consumers about a product's source[236] or dilute the uniqueness of the owners' marks in consumers' minds.[237] Modern federal trademark law is administered under the Lanham Act.[238]

a. *Neoclassical Rationality*

Despite its broad authority, the FTC's approach to advertising regulation has been self-constrained by an overarching guiding principle: preserving consumer choice and autonomy.[239]

The agency's emphasis on consumer choice is consistent with a traditional law-and-economics-style faith in free markets and the ability of consumers to make rational consumption choices that maximize their own welfare.[240] An extreme version of this philosophy would posit that advertising regulation is never warranted because the market will give advertisers adequate incentives to offer consumers relevant and truthful information about their products.[241] Goods and services providers who do not provide these disclosures will eventually be "outed" by their competitors and will fail in the marketplace if

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[233] A trademark is often a word or symbol, but under modern trademark jurisprudence trademark protection has been afforded to such signifiers as smells, *see In re* Clarke, 17 U.S.P.Q.2d (BNA) 1239, 1239 (T.T.A.B. 1990) (finding a signature scent on yarn to be eligible for trademark protection), and sounds, *see In re* General Electric Broadcasting Co., 199 U.S.P.Q. 560, 561–63 (T.T.A.B. 1978) (finding a series of bells broadcast by a radio station on the half hour could potentially be eligible for trademark protection); *see also* Neal R. Platt, *Is a Trademark Owner's Right To Use Its Mark Protected by the First Amendment?*, 11 HOFSTRA L. REV. 1261, 1262 (1983) ("A trademark can assume almost any imaginable form, as long as it is applied to the goods and is perceptible to the buying public.").

[234] 15 U.S.C. § 1127 (2012).

[235] *Id.* (setting forth the "use in commerce" requirement).

[236] Alfred C. Yen, *Intent and Trademark Infringement*, 57 ARIZ. L. REV. 713, 719 (2015).

[237] 15 U.S.C. § 1125(c); Jennifer E. Rothman, *Commercial Speech, Commercial Use, and the Intellectual Property Quagmire*, 101 VA. L. REV. 1929, 1942 (2015).

[238] Lanham Act, Pub. L. No. 79-489, 60 Stat. 427 (1946) (codified as 15 U.S.C. §§ 1051–1072).

[239] *See* M. Neil Browne et al., *Protecting Consumers from Themselves: Consumer Law and the Vulnerable Consumer*, 63 DRAKE L. REV. 157, 165–69 (2015) (arguing that the FTC's eventual decision not to regulate advertising to children in the 1970s was driven by an individualistic approach that assumes that parents can (and should) make appropriate consumption decisions for their children); Pitofsky, *supra* note 227, at 663–64 (arguing that most advertising regulation occurs to correct market failures that prevent consumers from getting the information they need to make rational consumption choices).

[240] *See* Pitofsky, *supra* note 227, at 663–64.

[241] *See id.* at 663.

they do not change their ways, passed over by perfectly rational consumers who now have appropriate information.[242]

Even the most devoted neoclassical law and economics scholars acknowledge that there can be market failures, however, and this is where a role for advertising regulation comes in under this theory.[243] The market may not provide monopolistic or oligopolistic sellers with adequate disclosure incentives, for example.[244] More generally, in some cases the expense of disclosure or the complexity of the relevant information might make it undesirable for otherwise motivated sellers to provide consumers with the data they need.[245] In these cases, according to neoclassical law and economics theory, the government should step in to ensure that sellers provide consumers with adequate product information.[246]

According to this account, government intervention is warranted not because we think that consumers cannot or will not make welfare-maximizing choices. To the contrary, neoclassical law and economics theory presumes that once armed with truthful and adequate information, consumers will make the personal welfare-maximizing choice.[247] The role of government intervention is simply to ensure that consumers do in fact receive this information.

Consistent with the premise of the welfare-maximizing rational actor, much of the FTC's consumer-protection activity centers on those situations where, for one reason or another, the market has failed to provide consumers with truthful or adequate information.[248] Greenwashing, health and fitness claims, gift cards, funeral services: these are all examples of situations where the public was being given false, misleading, or inadequate information by advertisers.[249]

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[242] *See id.*

[243] *Id.* at 664–67 (documenting market failures that may prevent sellers from providing adequate product disclosures).

[244] *Id.* at 665.

[245] *Id.* at 666.

[246] *See* Pitofsky, *supra* note 227, at 669–70.

[247] *See id.* at 674–75 (discussing how a consumer-oriented protection program would provide consumers with accurate and important product information so they can protect their interests).

[248] *See id.* at 669–70.

[249] *See, e.g.*, Greenwashing Press Release, *supra* note 229 (detailing FTC enforcement efforts against targeted companies for making "deceptive and unsubstantiated biodegradability claims"); Health Press Release, *supra* note 230 (quoting Director of the FTC's Bureau of Consumer Protection, Jessica Rich, for the proposition that health supplement companies targeted by the FTC "made misleading claims about their products"); Gift Card Press Release, *supra* note 231 (detailing FTC enforcement efforts against Kmart, who in marketing its gift cards "failed to disclose . . . fees . . . and misrepresented that the card would never expire"); Press Release, Fed. Trade Comm'n, Funeral Home Settles FTC Charges It Violated the Funeral Rule (Jan. 30, 2015), https://www.ftc.gov/news-events/press-releases/2015/01/funeral-home-settles-ftc-charges-it-violated-funeral-rule [https://perma.cc/U55H-3NEA] (detailing FTC undercover investigations meant to ensure that funeral homes comply with the Funeral Rule, "which requires funeral providers to provide information consumers need to compare prices and buy only the funeral services and

But beyond evidencing an economics-based faith in consumers' ability to maximize their own welfare, scholars have pointed out that the FTC's light-handed approach also appears to be guided by a commitment to the values of autonomy and individualism that goes beyond economic rationales.[250] According to this view, even in those cases where a consumer may be making the "incorrect" choice, from a welfare perspective, the FTC, as an agency, hesitates to constrain that choice out of deference to consumer autonomy.[251]

Evidence for this view comes from the history of the FTC's unfairness standard. Under the FTC Act, the agency has been given authority by Congress to regulate not only misleading and deceptive advertising practices, but also "unfair" practices.[252] In the late 1970s, the FTC attempted to exercise its broad jurisdiction by heavily regulating advertising directed at children, arguing that such advertising was often, due to the nature of its intended audience, inherently unfair.[253] After intense congressional and public backlash, much of it grounded in autonomy concerns (the *Washington Post*, for example, faulted the agency for its attempt to become a "national nanny"),[254] the FTC backed down.[255] What followed was a fourteen-year congressionally-initiated hiatus on new unfairness regulations.[256]

Since that time, the FTC has resurrected its unfairness policy, regulating advertising practices that in some cases go beyond simple deception or lack of disclosure.[257] But, mindful of the lessons learned in the late 1970s, it does so

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goods they want"). As I will later explain, although the agency has at times tried, under its expansive jurisdiction, to regulate advertising practices that go beyond simple deception or failure to disclose, they generally have not been successful in these efforts.

[250] Browne et al., *supra* note 239, at 166–69 (arguing that the FTC's eventual decision not to regulate advertising to children was driven by concerns about individualism and personal autonomy).

[251] *See* Kerran v. Fed. Trade Comm'n, 265 F.2d 246, 248 (10th Cir. 1959) ("[T]he public is entitled to know the facts . . . and then make its own choice . . . even though the choice is predicated at least in part upon ill-founded sentiment, belief, or caprice.").

[252] 15 U.S.C. § 45 (2012).

[253] *See, e.g.*, Browne et al., *supra* note 239, at 166–69; Maureen K. Ohlhausen, Essay, *Weigh the Label, Not the Tractor: What Goes on the Scale in an FTC Unfairness Cost-Benefit Analysis?*, 83 GEO. WASH. L. REV. 1999, 2004–05 (2015); J. Howard Beales, *The FTC's Use of Unfairness Authority: Its Rise, Fall, and Resurrection*, FED. TRADE COMMISSION (May 30, 2003), http://www.ftc.gov/public-statements/2003/05/ftcs-use-unfairness-authority-its-rise-fall-and-resurrection [https://perma.cc/A8AF-ZC8T].

[254] *The FTC as National Nanny*, WASH. POST (Mar. 1, 1978), https://www.washingtonpost.com/archive/politics/1978/03/01/the-ftc-as-national-nanny/69f778f5-8407-4df0-b0e9-7f1f8e826b3b/?utm_term=.7d0b9584563a [https://perma.cc/9U53-CXQS].

[255] Browne et al., *supra* note 239, at 168; Ohlhausen, *supra* note 253, at 2005.

[256] Beales, *supra* note 253; *see also* Federal Trade Commission Improvements Act of 1980, Pub. L. No. 96-252, 94 Stat. 374 (codified as amended in scattered sections of 15 U.S.C.).

[257] *See* Ohlhausen, *supra* note 253, at 2005–09; Beales, *supra* note 253.

with an explicit focus on consumer autonomy.[258] The three-part unfairness test currently in use focuses on consumer harm, but only harms that cannot be reasonably avoided by consumers.[259] If a consumer can reasonably avoid a harm, but chooses not to do so, the FTC will "respect that choice."[260]

Similar to the FTC, trademark scholars also embrace neoclassical law and economics rationales for trademark protection that privilege consumer autonomy. Currently, the most popular account of trademark law's purpose is the search cost theory, which posits that trademarks reduce consumer search costs by making it easier for them to identify the products they want.[261] By preventing advertisers from conveying confusing or misleading information about a product's source, trademark law helps consumers express their true preferences in the marketplace.[262] According to the theory, this also facilitates the market's effective functioning by giving producers the incentive to invest in high-quality products that consumers, armed with the right information, will choose over inferior offerings.[263]

Like the FTC's approach to advertising regulation, the consumer search cost account of trademark law is very much grounded in neoclassical law and economics theory and the concept of the rational actor consumer.[264] Similar to the sentiment motivating FTC regulation, the search cost theory conceives of trademark law as a market intervention designed to ensure that rational actor consumers receive the information they need to make welfare-enhancing choices.[265] Implicit in this goal is the assumption that consumers, due to their inherent rationality, will, when given the correct information, make the welfare-enhancing choice.

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[258] International Harvester, 104 F.T.C. 949, 1061, n.47 (1984); *see also* Beales, *supra* note 253 ("The primary purpose of the Commission's modern unfairness authority continues to be to protect consumer sovereignty by attacking practices that impede consumers' ability to make informed choices.").

[259] Ohlhausen, *supra* note 253, at 2006.

[260] Beales, *supra* note 253, at 5 ("[T]he concept of reasonable avoidance keeps the Commission from substituting its paternalistic choices for those of informed consumers.").

[261] Mark P. McKenna, *The Normative Foundations of Trademark Law*, 82 NOTRE DAME L. REV. 1839, 1844 (2007) ("It would be difficult to overstate the level of consensus among commentators that the goal of trademark law is—and always has been—to improve the quality of information in the marketplace and thereby reduce consumer search costs.").

[262] *E.g.*, Grynberg, *supra* note 228, at 1434; Glynn S. Lunney, Jr., *Trademark Monopolies*, 48 EMORY L.J. 367, 417, 432 (1999); McKenna, *supra* note 261, at 1844; *see also* Stacey L. Dogan & Mark A. Lemley, *The Merchandising Right: Fragile Theory or* Fait Accompli*?*, 54 EMORY L.J. 461, 467 (2005); Michael S. Mireles, Jr., *Towards Recognizing and Reconciling the Multiplicity of Values and Interests in Trademark Law*, 44 IND. L. REV. 427, 438–44 (2011).

[263] Grynberg, *supra* note 228, at 1434; Mireles, *supra* note 262, at 440–41.

[264] *See* McKenna, *supra* note 261, at 1844–46.

[265] *See* references cited *supra* note 262.

The popular law-and-economics-based search cost account of trademarks also implicitly reflects a concern for consumer autonomy.[266] By allowing mark owners to prohibit uses of a mark that might prevent consumers from accurately expressing their preferences, the search cost account aims to facilitate the exercise of consumer autonomy.[267] By allowing mark owners to prohibit *only* those uses and no others, the search cost account seeks to preserve as much competition, and as much consumer choice, as possible.[268]

b. *Bounded Rationality*

Scholars in the behavioral law and economics movement have pointed out that consumers, like actors in a range of situations, are boundedly rather than perfectly rational, and that this will affect how they respond to advertising and make consumption choices.[269] Jolls and Sunstein have argued that the FTC's approach to deceptive advertising is already, in some ways, consistent with bounded rationality principles.[270] Specifically, they note that the FTC's policy of restricting advertisements that highlight one or two product success stories is consistent with the behavioral finding that boundedly rational actors tend to overestimate their own chances of success based on such information.[271] But they also propose that the FTC could go further to tailor their advertising regulation to behavioral principles.[272] They argue, for example, that to counter consumers' optimism bias, firms could be required to frame product

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[266] *See* Mark P. McKenna, *A Consumer Decision-Making Theory of Trademark Law*, 98 VA. L. REV. 67, 114, 124–25 (2012) (explaining that law and economics scholars generally view advertising to be informational rather than persuasive in nature (which allows consumers to autonomously express their preferences without undue persuasive influence) but arguing that a consumer decision-making theory of trademark law would more effectively defer to consumer autonomy than the search cost theory).

[267] Jeremy N. Sheff, *Marks, Morals, and Markets*, 65 STAN. L. REV. 761, 802–03 (2013) (explaining how preventing consumer deception or confusion promotes consumer autonomy).

[268] *See* Daniel Gervais & Julie M. Latsko, *Who Cares About the 85 Percent? Reconsidering Survey Evidence of Online Confusion in Trademark Cases*, 96 J. PAT. & TRADEMARK OFFICE SOC'Y 265, 289 (2014) (arguing that overly expansive trademark protection could "eliminate materials that contribute to informed decision-making and overall consumer autonomy"); Grynberg, *supra* note 228, at 1441–42 (describing criticisms of efforts to prohibit the use of trademarked terms as internet keywords based on the argument that such uses have the potential to promote information dissemination and enhance consumer choice).

[269] *See, e.g.*, David Adam Friedman, *Debiasing Advertising: Balancing Risk, Hope, and Social Welfare*, 19 J.L. & POL'Y 539, 582–98 (2011) (analyzing how various biases and heuristics may contribute to consumers' response to product endorsements); Jolls & Sunstein, *supra* note 57, at 205–06.

[270] Jolls & Sunstein, *supra* note 57, at 215–16.

[271] *Id. But see* Friedman, *supra* note 269, at 582–90 (arguing that consumers' response to endorsements might be more complex than Jolls and Sunstein acknowledge).

[272] Jolls & Sunstein, *supra* note 57, at 215–16.

comparisons in terms of the potential harms arising from their own products, as opposed to the potential benefits arising from alternative products.[273] Importantly, Jolls and Sunstein argue that this debiasing approach (a method that seeks to correct for behavioral biases that lead to suboptimal decision-making) is consistent with the FTC's focus on autonomy, because it preserves consumer choice while attempting to correct for specific instances of bounded rationality.[274]

As with FTC advertising regulation, trademark scholars have noted that consumers, contrary to search cost theory's assumptions, are not always perfectly rational.[275] A particular challenge to the search cost account arises from the observation that advertising is not designed to be purely informational, as neoclassical law and economics scholars often assume.[276] Instead, it is designed to persuade, to deliberately appeal to consumers' irrational emotional responses.[277] Under this view, advertising is not as much about facilitating consumers' expression of preferences via information exchange as it is about creating, and manipulating, consumer preferences.[278]

Trademark scholars have a range of opinions on the correct policy response to advertising's deliberate appeal to irrationality. Graeme Austin argues that the distinction between consumers as rational processors of information and consumers as irrational beings subject to manipulation by advertisers is in some ways irrelevant because it tells us little about how trademark law should be structured.[279] Mark McKenna expresses the view that persuasive advertising is a phenomenon that, while not necessarily desirable, must be tolerated due to the lack of practical alternatives.[280] But he argues that consumers, due to paternalism concerns, should nevertheless be treated as autonomous agents,[281] and proposes his own consumer decision account of trademark law, which

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[273] *Id.* at 216.

[274] *See id.* at 202. *But see* Friedman, *supra* note 269, at 598–600 (arguing that though a debiasing approach might not result in fewer products on the market, it nevertheless might constrain choice by removing the "hope" aspect of a product from the market).

[275] *See* McKenna, *supra* note 266, at 114–15 ("Advertising, on this account, impedes competition by creating irrational brand preferences.").

[276] Graeme W. Austin, *Trademarks and the Burdened Imagination*, 69 BROOK. L. REV. 827, 854–58 (2004); McKenna, *supra* note 266, at 114.

[277] McKenna, *supra* note 266, at 115–17; Austin, *supra* note 276, at 856–58.

[278] McKenna, *supra* note 266, at 115–17; Austin, *supra* note 276, at 856–58.

[279] Austin, *supra* note 276, at 859 (arguing that the resolution of the debate "is unlikely to distil any meaningful implications for shaping of modern trademark policy").

[280] McKenna, *supra* note 266, at 117 ("Thus, the reason for tolerating non-deceptive advertising is neither that advertising generally promotes competition nor that consumers can be presumed capable of resisting persuasive messaging. The reason is instead simply that there is no reasonable, practicable alternative.").

[281] *Id.* at 120 ("To tell consumers that they cannot have the emotional or experiential value they derive from brands because it is not 'real' is remarkably paternalistic, and it implies that consumers are fools incapable of determining what they want.").

focuses primarily on prohibiting deceptive uses of trademarks.[282] Taking a different approach, Irina Manta suggests that the persuasive function of advertising can be welfare enhancing because it facilitates emotional and hedonic benefits for consumers.[283] While McKenna's approach, if adopted, would lead to significant changes in modern trademark doctrine,[284] Manta's proposal seeks instead to explain, and justify, trademark doctrine as it currently exists.[285]

c. *Malleable Rationality*

Scholars attuned to irrational and boundedly rational consumer behaviors have previously relied on bounded rationality to propose modifications to current FTC or trademark law.[286] My target is more fundamental. I argue that the fact of malleable rationality has implications for the foundation of consumer autonomy on which advertising law rests. In this section, I explore empirical psychological and neuroscientific evidence suggesting that child-directed advertising has long-lasting effects on the rationality of those exposed to it, reducing their future ability to respond to advertising in rational and truly autonomous ways. Thus, though the FTC's current policy of minimal regulation of child-directed advertising has grown in large part out of a desire to preserve consumer autonomy, the policy, due to the previously unaccounted-for phenomenon of malleable rationality, has the ironic consequence of undermining consumer autonomy in the long term.

Empirical evidence has been mounting about the effects of advertising on those exposed to it. The findings suggest this type of marketing has not only short-term, in-the-moment consequences for the preferences and decision-

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[282] *Id.* at 122–24.

[283] Irina D. Manta, *Hedonic Trademarks*, 74 OHIO ST. L.J. 241, 249 (2013) (providing "an alternative understanding of modern trademark doctrine that accounts for the hedonic experience of branded products").

[284] *See* McKenna, *supra* note 266, at 125–36 (calling into question the doctrines of sponsorship confusion, initial interest confusion, post-sale confusion, and dilution).

[285] Manta, *supra* note 283, at 255 (arguing that "the doctrines of initial interest confusion, post-sale confusion, sponsorship confusion, and dilution are likely all rooted in . . . a wish to protect consumer and overall utility").

[286] *See supra* Part III.B.2.b.

making processes of its targets,[287] but also longer-term effects on consumers' brains,[288] and, ultimately, their capacity to make autonomous decisions.[289]

One illustration is the surprising effect that advertising can have on consumers' long-term memories. Advertising viewed after a consumer has a particular experience with a product or service can actually change the

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[287] *See, e.g.*, GERARD HASTINGS ET AL., REVIEW OF RESEARCH ON THE EFFECTS OF FOOD PROMOTION TO CHILDREN, FINAL REPORT TO THE FOOD STANDARDS AGENCY 129 (Sept. 2003) (Scot.); COMM. ON FOOD MKTG. & THE DIETS OF CHILDREN & YOUTH, INST. OF MED. OF THE NAT'L ACADEMS., FOOD MARKETING TO CHILDREN AND YOUTH: THREAT OR OPPORTUNITY? 306–09 (J. Michael McGinnis et al. eds., 2006); OFFICE OF COMMC'NS, CHILDHOOD OBESITY—FOOD ADVERTISING IN CONTEXT: CHILDREN'S FOOD CHOICES, PARENTS' UNDERSTANDING AND INFLUENCE, AND THE ROLE OF FOOD PROMOTION 13, 14 (July 2004) (U.K.); Susan Auty & Charlie Lewis, *Exploring Children's Choice: The Reminder Effect of Product Placement*, 21 PSYCHOL. & MARKETING 697, 707 (2004); Dina L.G. Borzekowski & Thomas N. Robinson, *The 30-Second Effect: An Experiment Revealing the Impact of Television Commercials on Food Preferences of Preschoolers*, 101 J. AM. DIETETIC ASS'N 42, 44 (2001); K.A. Coon & K.L. Tucker, *Television and Children's Consumption Patterns: A Review of the Literature*, 54 MINERVA PEDIATRICA 423, 426 (2002) (reviewing the literature on child-directed food advertising); Corinna Hawkes, *Regulating Food Marketing to Young People Worldwide: Trends and Policy Drivers*, 97 AM. J. PUB. HEALTH 1962, 1963 (2007); Leslie Isler et al., *Children's Purchase Requests and Parental Responses: Results from a Diary Study*, 27 J. ADVERT. RES. 28, 38 (1987); Sonia Livingstone, *Assessing the Research Base for the Policy Debate over the Effects of Food Advertising to Children*, 24 INT'L J. ADVERT. 273, 283 (2005) (reviewing the literature on child-directed food advertising and concluding that "food promotion has a causal effect on children's food preferences, knowledge, and behaviour"); Thomas S. Robertson & John R. Rossiter, *Short-Run Advertising Effects on Children: A Field Study*, 13 J. MARKETING RES. 68, 69 (1976); Mary Story & Simone French, *Food Advertising and Marketing Directed at Children and Adolescents in the US*, Article in 1 *Int'l J. Behav. Nutrition & Physical Activity*, BMC 3, 14 (2004), https://ijbnpa.biomedcentral.com/track/pdf/10.1186/1479-5868-1-3?site=ijbnpa.biomedcentral.com [https://perma.cc/G8Y8-8H2M]; Kathy Baylis & Tirtha Dhar, Effect of the Quebec Advertising Ban on Junk Food Expenditure 1 (Mar. 16, 2007), http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.564.4479&rep=rep1&type=pdf [https://perma.cc/6GWC-RWXF].

[288] *See, e.g.*, Samuel M. McClure et al., *Neural Correlates of Behavioral Preference for Culturally Familiar Drinks*, 44 NEURON 379, 379, 383–84 (2004) (finding that while consumers prefer Pepsi to Coke in a blind taste test, when brand information is revealed, they prefer the taste of Coke, presumably because of their relationship with the Coke brand). As shown by brain imaging, subjects drinking Coke who know they are drinking Coke experience greater brain activity in pleasure and reward centers than when they drink Coke under blind conditions. *Id.* at 385. In other words, consumers experience greater pleasure drinking sugar water associated with the Coke brand than they do when drinking the same product carrying no such association. *Id.* Along the same lines, one study found that when subjects were exposed to relevant advertising before drinking bitter coffee, they tolerated the bitter taste more than subjects who had not seen the ads. Jerry C. Olson & Phillip A. Dover, *Disconfirmation of Consumer Expectations Through Product Trial*, 64 J. APPLIED PSYCHOL. 179, 185–88 (1979).

[289] *See, e.g.*, Paul M. Connell et al., *How Childhood Advertising Exposure Can Create Biased Product Evaluations that Persist into Adulthood*, 41 J. CONSUMER RES. 119, 130 (2014).

consumer's memory of his experience with that product or service.[290] We might remember a previously consumed brand of orange juice as being more tasty, for example, if we are later exposed to advertising highlighting the taste qualities of that brand.[291] We might even remember shaking Bugs Bunny's hand on our trip to Disneyland—a character not connected with or endorsed by Disney—if later advertising suggests that this is in fact what happened.[292] These modified memories are long lasting, and can serve as the basis for future feelings of brand identification and purchasing decisions.[293] More importantly for purposes of this Article, since we are, in some sense, a collection of memories and experiences, these findings demonstrate how advertising can change us, both psychologically and physiologically. The Jane Doe who has a memory of meeting Bugs Bunny at Disneyland is a slightly different person, with differently configured synaptic connections, than the Jane Doe who has no such memory.

The false memory studies tell us that exposure to advertising in certain situations can change our brains in long-lasting ways, creating memories or biases that didn't previously exist and that will influence future decision-making, through the process of neuroplasticity.[294] And when the target of that advertising is children, we expect those changes to occur even more readily, due to the relative plasticity of the child versus the adult brain.[295] We may also expect these changes that occur during childhood to play an outsized role in decision-making processes that persist throughout a child's life. Research shows that biases and associations acquired in childhood remain particularly accessible throughout adulthood and are uniquely resistant to being overridden by later acquired concepts.[296]

A striking example of this in the advertising context involves children's exposure to ads for sugary cereal featuring the lovable character Tony the Tiger (Tony). The exposure presumably changes the brains of these children such that they are hindered in their ability, as adults, to evaluate these products in an unbiased way.[297] Grown-ups with childhood experience of Tony judge his cereal to be healthier than similarly-situated subjects whose first introduction to

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[290] Kathryn A. Braun, *Postexperience Advertising Effects on Consumer Memory*, 25 J. CONSUMER RES. 319, 320, 322, 324–25 (1999); Kathryn A. Braun-LaTour et al., *How and When Advertising Can Influence Memory for Consumer Experience*, 33 J. ADVERT. 7, 8 (2004).

[291] Braun, *supra* note 290, at 324–25.

[292] Braun-La Tour et al., *supra* note 290, at 7–8, 17–19.

[293] *See* Braun, *supra* note 290, at 330–32.

[294] *See* Bryan Kolb & Robbin Gibb, *Brain Plasticity and Behaviour in the Developing Brain*, 20 J. CANADIAN ACAD. CHILD & ADOLESCENT PSYCHIATRY 265, 268–74 (2011) (explaining the age-dependent nature of brain malleability and describing various factors that can influence brain development in humans and other animals).

[295] *See id.* at 269.

[296] *See, e.g.*, Andrew W. Ellis et al., *Age of Acquisition and the Recognition of Brand Names: On the Importance of Being Early*, 20 J. CONSUMER PSYCHOL. 43, 49–50 (2010).

[297] Connell et al., *supra* note 289, at 130.

Tony occurred in adulthood.[298] The bias persists in subjects who have strong positive recollections of Tony even after behavioral debiasing techniques are deployed to help subjects make more rational judgments.[299] And it persists even when the subjects themselves are motivated to correct these biases.[300] Finally, these early-acquired biases lead Tony's childhood friends to evaluate brand extensions more favorably than those subjects who first met Tony as adults.[301]

The irony here should be clear. Advertising regulation and trademark law both get their current theoretical underpinnings from an assumption that consumers are capable of autonomous decision-making.[302] They also adopt a normative stance in favor of consumer autonomy—that it should be respected and facilitated whenever possible.[303] In the 1970s, the FTC chose not to aggressively regulate child-directed marketing, specifically because it was seen as interfering with the value of consumer autonomy.[304] But due to the previously overlooked phenomenon of malleable rationality, the FTC's autonomy-serving policy likely has precisely the opposite effect. Instead of promoting autonomy, the policy hinders consumers' ability to act autonomously by allowing advertisers to instill long-lasting and hard-to-overcome biases that prevent truly independent decision-making. Consumers having wonderful childhood memories of Tony the Tiger show biased health evaluations of his cereal and related brand extensions, *even when they really want to correct these biases*.[305] This does not sound like consumer autonomy.

Because we are failing to take account of the fact that rationality is a malleable characteristic, we find ourselves, in the context of advertising law, undermining the very values we are trying to promote.

This insight is different from, and more far-reaching than, the insight that consumers are boundedly (rather than purely) rational. Specifically, the observations about bounded rationality made in the advertising context have mostly reflected a static conception of rationality—the fact that consumers tend to overestimate their own chances for success when presented with one or two success stories in ads, for example,[306] or the fact that they tend to underestimate their chances of being harmed by a product.[307] These insights are about the bounded rationality of a consumer at the moment he is exposed to an ad, and do not depend in any way on previous interactions this consumer may have had with laws and policies that might have influenced his rationality in relevant ways over time. My insight, on the other hand, is one about the malleable nature

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[298] *Id.* at 122–23.
[299] *Id.* at 126–27.
[300] *Id.* at 128–30.
[301] *Id.*
[302] *See* McKenna, *supra* note 261, at 1844–46; Pitofsky, *supra* note 227, at 663–64.
[303] *See supra* notes 251–52, 267–69 and accompanying text.
[304] *See supra* notes 254–57 and accompanying text.
[305] Connell et al., *supra* note 289, at 128–30.
[306] Jolls & Sunstein, *supra* note 57, at 215–16.
[307] *Id.* at 207.

of rationality, and illuminates how policy decisions over time can mold, sometimes in unexpected ways, the rationality profile consumers bring to the table. Here, a policy enacted at *time* A—a hands-off approach to regulating child-directed advertising—affects the degree of rationality consumers exhibit at *time* B—when they are exposed to advertising later in life.

Further, while the bounded rationality insight in the advertising context has led scholars to either condone[308] or propose minor tweaks[309] to the FTC's approach, a full understanding of malleable rationality requires that we take the long view. We should not just be asking whether the FTC's approach helps the statically boundedly rational consumer make autonomous welfare-enhancing decisions in the moment of advertising exposure. Instead, we should think of the consumer as a malleable boundedly rational being. We should also be asking, then, how the FTC's approach will affect rationality—and thus either contribute to or detract from a consumer's ability to make autonomous welfare-enhancing decisions—in the long term.

In the example I raise here, a particular policy choice (not to comprehensively regulate child-directed advertising) will affect the decision-making capacity of targeted consumers years later, and will do so in a way that diminishes their ability to make welfare-enhancing consumption decisions in the long term. At this later point, the debiasing techniques proposed by bounded rationality scholars will be limited in their ability to correct this problem—as found in the Tony the Tiger study, consumers whose exposure to childhood advertising led to particularly positive feelings for Tony were unable to correct their biased opinions of the products he was hawking, even when traditional debiasing techniques were used.[310] Also crucial in light of the FTC's expressed preference for consumer autonomy is the fact that adults exposed to this advertising as children were unable to correct the resulting biases even when they wanted to.[311]

All this suggests that in this particular case, something more than debiasing is needed to correct the departures from pure rationality that lead to suboptimal consumer decision-making. Here, the solution, on a general level, is obvious, though counterintuitive: if the FTC is serious about consumer welfare and autonomy, it should, in consideration of the long-term effects of advertising on young consumers, exert more control over at least certain categories of child-directed advertising.[312]

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[308] *See id.* at 215–16.

[309] *Id.*

[310] Connell et al., *supra* note 289, at 128–30.

[311] *Id.*

[312] More control in this context might involve a number of possible things. To offer one example, the FTC could limit the extent to which advertisers can market to children using fanciful characters like Ronald McDonald or animals with human-like traits—characters with whom children develop strong and long-lasting emotional attachments. *See* Paul M. Connell, *The Role of Baseline Physical Similarity to Humans in Consumer Responses to Anthropomorphic Animal Images*, 30 PSYCHOL. & MARKETING 461, 465 (2013); Judith A.

But my aim here is not to argue that child-directed advertising is a bad idea. Rather, it's to highlight the crucial importance of taking the malleable nature of rationality into account when designing law and policy in any particular area. If we don't, we may be enacting policies we think are accomplishing one thing but are in fact undermining the very goals we seek to achieve, along with the correct functioning of the laws put in place to attain them. In advertising and trademark law, the current laissez faire approach to emotionally appealing advertising—particularly when it is directed at children—is driven by a desire to respect individual autonomy, yet it may be hurting consumers' ability to make truly autonomous consumption decisions in the long term.[313] As the proper functioning of trademark and advertising law as currently conceived depends on consumers being autonomous agents, this is something we should be taking into account when thinking about whether the current approach is the best one.

IV. IMPLICATIONS

As the examples in the last Part demonstrate, the previously overlooked malleable nature of rationality has practical implications for legal theories and doctrines in various areas. In this Part, I broaden the field of vision to explore how the theory of malleable rationality affects our understanding of decision-making models and policy making more generally.

A. *Positive Accounts of Decision-Making*

Currently, the most realistic models of behavior incorporate the concept of bounded rationality, accounting for the role that various heuristics and biases play in an actor's decision-making process.[314] But, as explained, they generally

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Garretson & Scot Burton, *The Role of Spokescharacters as Advertisement and Package Cues in Integrated Marketing Communications*, 69 J. MARKETING 118, 118 (2005); Elizabeth S. Moore & Richard J. Lutz, *Children, Advertising, and Product Experiences: A Multimethod Inquiry*, 27 J. CONSUMER RES. 31, 44 (2000). Additionally, these characters' presence in food marketing leads children to experience the advertised foods as better tasting. Matthew A. Lapierre et at., *Influence of Licensed Spokescharacters and Health Cues on Children's Ratings of Cereal Taste*, 165 ARCHIVES PEDIATRICS & ADOLESCENT MED. 229, 232 (2011); Christina A. Roberto et al., *Influence of Licensed Characters on Children's Taste and Snack Preferences*, 126 PEDIATRICS 88, 91–92 (2010). Another possible intervention by the FTC would be to limit the degree to which advertisers can intentionally use a targeted child's peers to market their products and services, since peer evaluations and endorsements have been shown to greatly influence a child's perception of a product. Patti M. Valkenburg & Moniek Buijzen, *Identifying Determinants of Young Children's Brand Awareness: Television, Parents, and Peers*, 26 J. APPLIED DEVELOPMENTAL PSYCHOL. 456, 464 (2005) (finding that "susceptibility to peers significantly predicted brand recognition" in young children).

313 *See supra* notes 299–303 and accompanying text (Tony the Tiger study).

314 *See supra* Part II.B.

do not recognize how previous laws and policies may have altered an actor's decision-making capacity in long-lasting and relevant ways.[315]

The fact that an individual grew up in poverty due to a policy that prioritized law enforcement over social welfare programs, for example, gives us important additional information about how she will approach the decision to commit a crime.[316] Though people, in general, are subject to impulse effects, this individual and others like her will exhibit systematically greater susceptibility to these effects than one would otherwise expect.[317] This again, is due to the workings of malleable rationality—in particular here, the role that an impoverished upbringing has on brain development as it relates to impulse control.[318] If we want to accurately predict how a member of this identified population will react in a criminal decision-making situation, our models should account for this. Similarly, one effect of policies that allow children to be targeted with advertising for unhealthy products featuring loveable cartoon characters is the long-lasting impaired capacity of this population to make truly autonomous and unbiased evaluations of these and related products throughout their lives, even after traditional debiasing techniques are deployed.[319] This information is crucial if we wish to accurately predict how this population will respond in a consumer-choice context.

These are just two examples, and there are potentially many more. Indeed, the task of identifying the myriad ways in which previous, perhaps seemingly unrelated policies have molded rationality in ways relevant to a particular decision may seem like a daunting one. In this sense, malleable rationality suffers from the same critique leveled at bounded rationality—that it is "ad hoc" because, rather than being a comprehensive theory, it depends on scholars identifying and incorporating salient empirical behavioral results.[320]

I am sympathetic to this critique, and I do not suggest that we need comprehensively catalog and analyze all relevant empirical results at once. Instead, I seek to begin a conversation here by offering a few examples of empirical results that, due to malleable rationality, have previously unidentified consequences for law and policy. Recognizing the importance of malleable rationality opens a new field of research, and my position is that any acknowledgment of this phenomenon is a positive development that will add realism to current positive accounts of decision-making. My hope is that other scholars will join in the task of identifying additional relevant empirical results that have relevance to decision-making, through the workings of malleable rationality, in their particular fields.

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315 *See supra* Part III.A.2.

316 *See supra* Part III.B.1.a.

317 Holz et al., *supra* note 138, at 996–97.

318 *See, e.g.*, Hanson et al., *supra* note 168, at 2.

319 *See supra* notes 299–303 and accompanying text (Tony the Tiger study).

320 Mitchell, *supra* note 6, at 169–70; Posner, *supra* note 66, at 1552; Hubbard, *supra* note 6, at 38–40.

B. *Prescriptive and Normative Analyses*

Predicting how an individual will respond to a specific law or policy through positive accounts of decision-making is arguably only the first step for a legal scholar. Ultimately, the goal should be to craft laws and policies in ways that make society better. This is what libertarian paternalism—a normative outgrowth of the behavioral law and economics approach—seeks to do, by taking advantage of behavioral insights to direct behavior in welfare-enhancing ways.[321]

The premise of libertarian paternalism is that institutions (both public and private) should endeavor to influence people's behavior in ways that enhance welfare.[322] According to its proponents, libertarian paternalistic goals can be achieved by harnessing insights about bounded rationality.[323] One way to do this is to correct for identified instances of bounded rationality that lead to welfare-diminishing behavior. Jolls and Sunstein call this tack "debiasing through law."[324] They offer up the possibility of correcting for smokers' tendency to underestimate their personal health risks by harnessing the availability heuristic, for instance.[325] If we make illustrations of smoking harm more available, smokers may correct their inappropriately low perceptions of risk and take action accordingly.[326]

A related concept is that of the "nudge"—taking advantage of our knowledge of bounded rationality to nudge people towards welfare-enhancing behaviors.[327] According to Sunstein and Thaler, one way we can nudge people is through default rules.[328] As prospect theory predicts, people are influenced in their decision-making by their reference point, including the default rule that exists at the time they make their choice.[329] By setting the default to a welfare-enhancing option, we take advantage of this insight and make it much more likely that a person will make the welfare-enhancing choice.[330] When employers automatically enroll their employees in savings plans (with an opt-out option), for instance, savings and enrollment increase significantly.[331]

Libertarian paternalism is paternalistic because it presumes to know what is best for individuals and attempts to direct behavior in ways consistent with that

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[321] RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS 4–6 (2008).

[322] *Id.*

[323] Cass R. Sunstein & Richard H. Thaler, *Libertarian Paternalism Is Not an Oxymoron*, 70 U. CHI. L. REV. 1159, 1161, 1170 (2003).

[324] Jolls & Sunstein, *supra* note 57, at 199–203.

[325] *Id.* at 212–15.

[326] *Id.*

[327] *See* THALER & SUNSTEIN, *supra* note 321 (describing how libertarian paternalism could be used to influence human behavior).

[328] *Id.* at 83–87.

[329] *See* Kahneman & Tversky, *Prospect Theory*, *supra* note 43, at 277.

[330] *See* Sunstein & Thaler, *supra* note 323, at 1159–62.

[331] *Id.* at 1161.

understanding.[332] It is libertarian because it does not aim to restrict behavior in the classic paternalistic sense. Instead, it relies on legal and organizational rules that encourage, without forcing, welfare-enhancing decision-making.[333] Because behavioral findings suggest that people's preferences are highly susceptible to outside influences, its champions argue that some form of paternalism is inevitable; given this, paternalism may as well be consciously employed in the service of welfare enhancement.[334]

Not surprisingly, my proposition has implications not only for bounded rationality theory, but also for libertarian paternalism and policy prescriptions more generally. An understanding of malleable rationality can help advance libertarian paternalist goals and avoid libertarian-paternalist-inspired interventions, which, due to the theory's incomplete depiction of how policies

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[332] Thaddeus Mason Pope, *Counting the Dragon's Teeth and Claws: The Definition of Hard Paternalism*, 20 GA. ST. U. L. REV. 659, 660 (2004) (defining paternalism as "the restriction of a subject's self-regarding conduct primarily for the good of that same subject").

[333] THALER & SUNSTEIN, *supra* note 321, at 4–6.

[334] Sunstein & Thaler, *supra* note 323, at 1164. Libertarian paternalism is not without its detractors. Some critics contest Sunstein and Thaler's assertion that the movement sufficiently preserves individual liberties. *See e.g.*, Bubb & Pildes, *supra* note 71, at 1599 (arguing that in many cases libertarian paternalism's preservation of choice through "opt-outs" is more theoretical than factual); Jonathan Klick & Gregory Mitchell, *Government Regulation of Irrationality: Moral and Cognitive Hazards*, 90 MINN. L. REV. 1620, 1621–23 (2006) (expressing concern that a libertarian paternalism approach will stifle the development of individuals' decision-making skills); Gregory Mitchell, Review Essay, *Libertarian Paternalism Is an Oxymoron*, 99 NW. U. L. REV. 1245, 1245–46 (2005) (critiquing Sunstein and Thaler's "failure to justify the choice of welfare over liberty as the value guiding the paternalistic side of libertarian paternalism" and contesting their assertion that some form of paternalism in regulation is inevitable); Wright & Ginsburg, *supra* note 43, at 1036 (arguing that libertarian paternalism inappropriately ignores "the economic welfare and liberty value of allowing individuals the freedom to err"). A second concern is that policy makers are ill-equipped to implement libertarian paternalism in welfare-enhancing ways because they lack the necessary knowledge, Mario J. Rizzo & Douglas Glen Whitman, *Little Brother Is Watching You: New Paternalism on the Slippery Slopes*, 51 ARIZ. L. REV. 685, 686 (2009) [hereinafter Rizzo & Whitman, *Little Brother*], are not operating under the right incentives, *id.* at 687; *see also* Edward L. Glaeser, *Paternalism and Psychology*, 73 U. CHI. L. REV. 133, 144–49 (2006); Aneil Kovvali, *Who Are You Calling Irrational?*, 110 NW. U. L. REV. 707, 708 (2016) (reviewing CASS R. SUNSTEIN, WHY NUDGE? THE POLITICS OF LIBERTARIAN PATERNALISM (2014)) (asserting that "regulators who deploy nudges will inevitably apply their own preferences instead of advancing the goals of those who are nudged"); Mario J. Rizzo & Douglas Glen Whitman, *The Knowledge Problem of New Paternalism*, 2009 BYU L. REV. 905, 908 (2009) [hereinafter Rizzo & Whitman, *The Knowledge Problem*], or because they themselves are subject to the same cognitive biases behavioral law and economics identifies, Glaeser, *supra*, at 142; Kovvali, *supra*, at 708 (pointing out that "multimember legislative bodies are subject to many of the same quirks as individuals, raising questions about the government's ability to improve on individuals' choices"); Rizzo & Whitman, *Little Brother*, *supra*, at 687; Rizzo & Whitman, *The Knowledge Problem*, *supra*, at 908. A third concern is that libertarian paternalism fails to appropriately account for traditional market failures. Bubb & Pildes, *supra* note 71, at 1606.

affect decision-making capacity over time, might lead to unintended counterproductive results. When we better understand the decision-making capacity an actor brings to a given situation and how past laws and policies contributed to that capacity, we are better positioned to direct behaviors in welfare-enhancing ways. Here, I discuss three ways the insights of malleable rationality can help us craft better laws and policies.

1. *Identifying Target Populations for Nudging and Debiasing*

Libertarian paternalists speak of 'debiasing'—enacting laws and policies to counteract behavioral biases that lead to suboptimal decision-making[335]—and 'nudging'—enacting laws and policies that take advantage of behavioral biases to promote good decisions.[336] An understanding of malleable rationality will help us with these tasks. In particular, it enables us to identify populations whose decision-making capacity departs from expectations in identifiable ways because they were subject to a particular policy in the past. This, in turn, allows us to target appropriate libertarian paternalistic interventions at these identified populations. It tells us who to focus scarce resources on, and gives us information about what needs to be done.

The insight that heightened impulse effects arise from impoverished backgrounds, for example, helps us by alerting us to the fact that populations growing up in poverty may be subject to these effects when making decisions about criminality.[337] We now know there is a population at risk for heightened impulse effects, and we can take targeted measures to counter these effects. In a traditional libertarian paternalist scenario, this would be done by adopting one or more of a number of possible legal interventions that seek to reduce the negative effects of bounded rationality at the time of decision-making.[338] Highly publicizing instances of criminal punishment to at-risk populations, for example, may make punishment more "available" to these populations and help counter their impulsivity when faced with the decision to commit a crime.[339] Or, as Jolls, Sunstein, and Thaler also suggest, increasing the certainty of punishment, but limiting the duration of that punishment, might most efficiently create deterrence effects in populations subject to self-control problems, since these populations are subject to hyperbolic discounting and may be more swayed by a high risk of punishment than by a lower risk of a more severe punishment.[340]

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[335] Jolls & Sunstein, *supra* note 57, at 199–203.

[336] *See* THALER & SUNSTEIN, *supra* note 321, at 4–6; *see also* Sunstein & Thaler, *supra* note 323, at 1162.

[337] *See supra* notes 184–94 and accompanying text.

[338] Jolls & Sunstein, *supra* note 57, at 199–203.

[339] Jolls et al., *supra* note 1, at 1538.

[340] *Id.* at 1538–40.

2. *Understanding the Limits of Nudging and Debiasing and Revealing Alternative Approaches*

Though the insights of malleable rationality can help us identify target populations for nudging and debiasing, they can also alert us to situations where debiasing and nudging might in fact not work as expected. In these situations, employing these traditional libertarian paternalistic interventions would be wasteful at best.

For example, the study showing that children having positive interactions with a loveable cereal-selling cartoon character exhibited biased health evaluations of the cereal as adults also found that these biases were very hard to overcome, even when traditional debiasing techniques were used.[341] This is thought to be in part due to the resilient nature of biases and associations acquired in childhood.[342] What this tells us is that in this particular situation, and perhaps others like it, debiasing might in fact not be very effective. It would therefore be wasteful to enact policies trying to debias populations who, because of their earlier experiences, have biases that are resistant to such interventions. If we think it is welfare enhancing for people to make autonomous consumer choices, or alternatively, to make healthy food consumption choices, we need to think of an alternative approach.

Luckily, the insights of malleable rationality provide this alternative. Malleable rationality is all about how decision-making capacity changes over time in response to earlier policies. It thus—in contrast to libertarian paternalism, which focuses almost exclusively on interventions that take place at the time of decision-making[343]—reveals a new temporal target for intervention: the earlier point in time when the policy that first modified decision-making capacity was enacted. In the advertising scenario, we may not be able to do much by way of debiasing by the time people with entrenched biases are making decisions about which cereal to buy.[344] But we can target the policy that facilitated the formation of those biases in the first place. We might choose, for example, to limit the extent to which advertisers can market to children using fanciful characters like Ronald McDonald or animals with human-like traits—characters with whom children develop strong and long-lasting emotional attachments,[345] and whose presence in food marketing leads children to experience the advertised foods as better tasting.[346] Another possible intervention would be to limit the degree to which advertisers can intentionally use a targeted child's peers to market their products and services, since peer

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[341] Connell et al., *supra* note 289, at 127–30.

[342] Ellis et al., *supra* note 296, at 50.

[343] *See* THALER & SUNSTEIN, *supra* note 321 (describing how libertarian paternalism could be used to influence human behavior).

[344] *See* Connell et al., *supra* note 289, at 121.

[345] *See* Connell, *supra* note 312, at 465; Garreston & Burton, *supra* note 312, at 121–22; Moore & Lutz, *supra* note 312, at 44.

[346] Lapierre et al., *supra* note 312, at 232; Roberto et al., *supra* note 312, at 88, 92.

evaluations and endorsements have been shown to greatly influence a child's long-term perception of a product.[347] Rather than focusing on countering the negative effects of a bias at a later time, when those negative effects manifest themselves through decision-making, an understanding of malleable rationality allows us to target, and perhaps prevent, the formation of the bias in the first place.

This insight applies equally to those situations where debiasing and nudging at the time of decision-making may in fact prove to be effective. In the case of enhanced impulse effects arising from an impoverished background, for example, I discussed two behavioral-economics-inspired interventions designed to influence the decision-making of an actor at the moment she is faced with a choice to commit a crime.[348] But the insights of malleable rationality suggest that we have another set of alternatives: interventions that target the undesirable changes to decision-making capacity, either before these changes occur, or before they have a chance to be tested in the moment of choice.

As for the former, if we think that the consequences of poverty on criminal decision-making are detrimental enough to justify the costs, we could target the earlier policy that is contributing to the harmful expression of bounded rationality in the first place—in this case, a defunding of social welfare programs that led to increased poverty. By changing the policy that led to detrimental effects on decision-making, we need no longer worry about countering these effects at a later time through debiasing or other behavioral-law-and-economics-inspired techniques.

As for the latter, we might choose to undertake early interventions aimed at reducing impulsivity in the at-risk population in the long-term. Thus, though children growing up in poverty may indeed be subject to greater impulse effects as a result of their upbringing, we could target members of this population before they are faced with a decision to commit a crime with interventions designed to reverse the detrimental brain changes that led to these effects. Scientists are currently exploring various approaches for accomplishing this very goal.[349]

3. *Avoiding Unintended Consequences*

Finally, an understanding of malleable rationality can open our eyes to unintended and perhaps detrimental effects of unrelated (or even related) policies for welfare-enhancing goals. In the criminal law context, policies contributing to impoverishment and exposure to violent media in childhood lead to long-lasting brain changes that are detrimental from a criminal deterrence

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[347] Valkenburg & Buijzen, *supra* note 312, at 464 (finding that "susceptibility to peers significantly predicted brand recognition" in young children).

[348] *See supra* Part IV.B.1.

[349] *See, e.g.*, Markant et al., *supra* note 195, at 30 (testing a spatial cueing task in nine-month-old infants and finding that it neutralized the negative effects of low socioeconomic status on memory function).

(and arguably broader social welfare) perspective.[350] And in advertising law, policies undertaken in the service of consumer autonomy may actually undermine the expression of autonomy in the long term.[351] In these cases, a policy maker may need to address the unrelated policy to ensure her goals are met.

But apart from these examples, the phenomenon of malleable rationality raises the possibility that even policy interventions intentionally undertaken for the libertarian paternalist purpose of enhancing welfare may have long-lasting, unanticipated, and detrimental effects on the decision-making capacity of those subject to them. An effort to publicize law enforcement efforts in order to counter enhanced impulsivity through the availability heuristic,[352] for example, may also have unanticipated, and undesirable, effects on the rationality of targeted actors. If the publicity surrounding criminal enforcement focuses on crimes perpetrated by racial minorities, the result may be the long-lasting instilment or reinforcement of harmful racial stereotypes.[353] This could lead to welfare-diminishing outcomes in other situations, like the increased use of racial profiling tactics by law enforcement[354] or more violence against minority populations that is ultimately found to be legally justified under self-defense doctrines.[355] If a libertarian paternalist's goal is to enhance welfare overall by taking advantage of bounded rationality, this goal will be undermined to the extent she fails to recognize the potentially long-lasting and harmful effects on rationality her own efforts might trigger. An understanding of malleable rationality will help her avoid these harmful consequences.

V. CONCLUSION

Neoclassical law and economics has given us a valuable tool for describing human behavior and crafting legal rules to channel this behavior in efficient directions. Behavioral law and economics gives us a more nuanced view of the human as decision-maker, and in this way helps us craft laws and policies that

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[350] *See supra* Part III.B.1.b.

[351] *See supra* Part III.B.2.

[352] Jolls et al., *supra* note 1, at 1538.

[353] *See* Cass R. Sunstein, *Hazardous Heuristics* 3 (U. Chi. L. Sch. Coase-Sander Inst. L. & Econ., Working Paper No. 165, 2002), https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1137&context=public_law_and_legal_theory (on file with *Ohio State Law Journal*).

[354] *See* Samuel R. Gross & Debra Livingston, Essay, *Racial Profiling Under Attack*, 102 COLUM. L. REV. 1413, 1427, 1430 (2002) (noting the harms that may arise from racial profiling and suggesting that these harms need to be weighed against the benefits hoped to be achieved from the practice); William J. Stuntz, Terry*'s Impossibility*, 72 ST. JOHN'S L. REV. 1213, 1218 (1998) (outlining the harms that flow from racial profiling).

[355] Cynthia Kwei Yung Lee, *Race and Self-Defense: Toward a Normative Conception of Reasonableness*, 81 MINN. L. REV. 367, 464 (1996) (discussing how racial stereotypes may lead juries more often to give credence to a theory of self-defense when the victim of violence is a racial minority).

are better able to meet the needs of real people living in real societies. But both neoclassical and behavioral law and economics have heretofore ignored a crucial point: that laws and policies change the people who are subject to them. Rationality, whether neoclassical or bounded, is not static. It changes over time as we live through experiences that are dictated in part by the laws and policies of our governments.

In at least some instances, we can identify through psychology and neuroscience studies how specific policies will affect future decision-making. Here, I offer three examples—one drawn from advertising law and two from criminal law—where the consequences of a specific policy for future decision-making are profound. If we want to avoid unintended consequences and are serious about crafting legal systems in ways that enhance welfare, we must start taking the malleable nature of rationality into account.