PERSONALIZING DEFAULT RULES AND DISCLOSURE WITH BIG DATA

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This Article provides the first comprehensive account of personalized default rules and personalized disclosure in the law. Under a personalized approach to default rules, individuals are assigned default terms in contracts or wills that are tailored to their own personalities, characteristics, and past behaviors. Similarly, disclosures by firms or the state can be tailored so that only information likely to be relevant to an individual is disclosed and information likely to be irrelevant to her is omitted. The Article explains how the rise of Big Data makes the effective personalization of default rules and disclosure far easier than it would have been during earlier eras. The Article then shows how personalization might improve existing approaches to the law of consumer contracts, medical malpractice, organ donation, inheritance, landlord–tenant relations, and labor law.

The paper makes several contributions to the literature. First, it shows how data mining can be used to identify particular personality traits in individuals, and these traits may in turn predict preferences for particular packages of legal rights. Second, it proposes a regime whereby a subset of the population ("guinea pigs") is given a lot of information about various contractual terms and plenty of time to evaluate their desirability, with the choices of particular guinea pigs becoming the default choices for those members of the general public who have similar personalities, demographic characteristics, and patterns of observed behavior. Third, we assess a lengthy list of drawbacks to the personalization of default rules and disclosure, including cross subsidization, strategic behavior, uncertainty, stereotyping, privacy, and institutional-competence concerns. Finally, we explain that the most trenchant critiques of the disclosure strategy for addressing social ills are really criticisms of impersonal disclosure. Personalized disclosure not only offers the potential to cure the ills

associated with impersonal disclosure strategies, but it can also ameliorate many of the problems associated with the use of personalized default rules.

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INTRODUCTION

Law is impersonal. The state generally does not tailor the contents of the law to people's characteristics and traits. In this Article, we argue that in the era of Big Data, law should become more personalized. Our main focuses are default rules (situations where people face a choice between sticking with a default option or specifying a different option instead) and disclosure (where the law mandates that individuals receive particular information).

Our claim has important applications to contract law, consumer law, inheritance law, medical malpractice, property law, labor law, privacy law, organ donation law, and other fields.

Let us illustrate our approach with an example from inheritance law. Empirical research has shown that married fathers are more likely than married mothers to bequeath all their property to their spouses (55% compared to 34%).[1] Moreover, according to these studies, men bequeath significantly larger shares of their estates to their spouses (80% of estates are willed to widows versus 40% to widowers).[2] These data are consistent with rational-choice models of behavior: wives trust their husbands less than husbands trust their wives to use inherited resources in the best interests of their mutual children, since men are significantly more likely to remarry and devote resources to the children from their second marriage, which comes at the expense of children from their first marriage.[3]

If men's testamentary preferences differ systematically from women's, why should intestacy laws continue to be gender neutral?[4] Why not have different default intestacy rules for men and women instead? We argue that as long as these preferences remain stable and gender correlated, a different set of default rules for women would lead in the long run to more estate resources being allocated to heirs according to decedents' true preferences. We further posit that it may be desirable to use other readily observable characteristics (e.g., wealth, health, time of marriage, age of children, and occupation) that could predict default rules in intestacy for population subgroups. As with any default rules, individuals would be free to alter these defaults by executing a will.[5]

We also advocate a more ambitious version of personalization here, one that would let courts determine how an intestate's estate should be allocated based on an analysis of his consumer behavior during his lifetime. In the era of Big Data,[6] we suggest that it will be possible to find individuals whose observable behavior and characteristics closely match those of the intestate—we refer to these people as "guinea pigs"—to examine the kinds of

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1.   Daphna Hacker, *The Gendered Dimensions of Inheritance: Empirical Food for Legal Thought*, 7 J. Empirical Legal Stud. 322, 334 (2010); Debra S. Judge & Sarah Blaffer Hardy, *Allocation of Accumulated Resources Among Close Kin: Inheritance in Sacramento, California, 1890–1984*, 13 Ethology & Sociobiology 495 (1992).

2.   Hacker, *supra* note 1, at 334.

3.   Debra S. Judge, *American Legacies and the Variable Life Histories of Women and Men*, 6 Hum. Nature 291, 307–08 (1995).

4.   We will simplify the analysis by assuming that people of a particular gender who have wills and people of the same gender who die intestate have similar preferences—but this is an assumption that ought to be tested empirically. *See generally* Hacker, *supra* note 1, at 329 (noting that on average intestates die at a younger age than testators); Adam J. Hirsch, *Default Rules in Inheritance Law: A Problem in Search of Its Context*, 73 Fordham L. Rev. 1031, 1073 (2004) (noting that intestates are poorer than testators and that this factor may engender selection effects).

5.   We take for granted the law's assumption that ordinarily the decedent's wishes should be the overriding factor in determining how her estate will be divided.

6.   *See infra* text accompanying note 68.

choices that the guinea pigs made in *their* wills and then to use these choices as a template for determining what the intestate likely would have wanted.[7] An upshot of widely employing this approach is that more estates would be allocated in a way that better approximates the true preferences of the decedent. Given the fact that most individuals leave no wills, this advantage could be significant. Furthermore, with detailed intestate defaults, many individuals who would have otherwise needed to incur the expenses of drafting wills now may no longer need to do so. After all, they will recognize that even in the absence of a written will, their intestacy rules will be personalized and hence will more closely approximate what they would have wanted than will the status quo's one-size-fits-all approach.

We are not the first to raise the possibility of using personalized default rules. Recently, Cass Sunstein offered a provocative assessment of existing, impersonal default rules and suggested two alternatives to them: active choices and personalized default rules.[8] Sunstein's work continues a conversation begun by Ian Ayres, who first argued that default rules could be "tailored" to market conditions or the attributes of parties.[9] This conversation was extended by George Geis, who modeled tailored and untailored default rules under particular sets of assumptions to analyze the welfare implications of trading off precision against complexity.[10]

Sunstein's bottom line is that "personalized default rules are the wave of the future. We should expect to see a significant increase in personalization as greater information becomes available about the informed choices of diverse people."[11] We agree wholeheartedly and regard his contribution to the literature as significant. He astutely notes that the appeal of personalized default rules depends on the heterogeneity among a given population, the state's access to information about individuals' preferences and its ability to create a structure conducive to rational choices, the richness of the data available about individual preferences, and the transaction and confusion costs associated with prompting parties to a transaction to make active choices about the parameters of a deal.[12] He inventively envisions personalized default rules in contexts like the choice of retirement plans, cell phone

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7.   For much more on guinea pigs, see *infra* Section II.C.

8.   Cass R. Sunstein, *Deciding by Default*, 162 U. Pa. L. Rev. 1 (2013). Under a regime of active choice, individuals are forced to decide among various options—the contract cannot be silent with respect to a particular term.

9.   Ian Ayres, *Preliminary Thoughts on Optimal Tailoring of Contractual Rules*, 3 S. Cal. Interdisc. L.J. 1, 4 & n.15 (1993); *see also* Ian Ayres & Robert Gertner, *Majoritarian vs. Minoritarian Defaults*, 51 Stan. L. Rev. 1591, 1593, 1596–06 (1999) (identifying several types of contracting party heterogeneity and showing how they might affect the law's choice among defaults preferred by the majority of contracting parties or those preferred only by a minority).

10.   George S. Geis, *An Experiment in the Optimal Precision of Contract Default Rules*, 80 Tul. L. Rev. 1109 (2006).

11.   Sunstein, *supra* note 8, at 57.

12.   *Id.* at 9–10.

plans, mortgages, and other settings.[13] That said, Sunstein's discussion of personalized default rules is truncated—it is a short part of a short essay. He has not addressed the question of how courts would apply personalized default rules. And the earlier work by Ayres and Geis explicitly lumps together default rules that are tailored based on both contracting parties' characteristics *and* market conditions, focusing—in the abstract—on the costs of promulgating and adjudicating tailored default rules.[14]

No scholars have previously offered a comprehensive theory of personalized default rules, nor has anyone explored in detail the feasibility of such an approach. In this Article, we will develop such a theory, show its feasibility in the real world, and point out what legislatures and courts should do in order to make a personalized default-rule regime implementable in many fields. In particular, we will show that with a bit of innovative tweaking, tools developed in the age of Big Data can facilitate providing certainty around the meaning of default terms for heterogeneous individuals and firms. By mitigating the uncertainty associated with the development of personalized default rules, Big Data can make personalization far more appealing than it was in previous information environments.

The Article proceeds as follows. Part I explores the existing conceptions of default rules and identifies the dominant strategies for supplying such rules: majoritarian default rules and minoritarian (penalty) default rules. It then shows how each type of default rule might be improved via personalization, such that the content of the rule in question will differ among heterogeneous individuals. In this Part, we illustrate our claims mostly through consumer contracts and point out the main considerations that could make the personalized default-rules approach a viable option.

Part II examines the feasibility of personalizing default rules. It observes that crude default rules—which use one readily observable characteristic, such as gender or age, to sort individuals into appropriate default rules—are already feasible but are also imprecise and can be morally problematic. We show that granular default rules, which sort individuals into several or many different default terms based on the interactions of multiple factors, are becoming increasingly feasible in the era of Big Data. Part II also examines some of the potential gains from using both crude and granular default rules in inheritance law, consumer law, the law of medical malpractice, real property law, and potentially even in labor law. A key innovation in Part II is our proposed use of "guinea pigs" to personalize defaults. Under such an approach, a small portion of the population is given a great deal of information and time to make decisions, and then the remaining members of the population are assigned the default terms chosen by the guinea pigs whose observed behavior and characteristics most closely match their own.

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13.   *See, e.g.*, *id.* at 5–7, 37, 47, 56.

14.   *See* Ayres, *supra* note 9 (analogizing the tailored-versus-untailored default-rule dilemma to the rules-versus-standards debate); Geis, *supra* note 10, at 1124–29 (discussing the expected costs of having tailored default rules).

Part III considers a number of important objections to our proposal for personalizing default rules. These objections include concerns about unfair cross subsidies; strategic behavior by consumers; abuse by merchants; uncertainty and the fragmentation of case law interpreting contractual language; the use of statistics and stereotypes; the constitutional implications of a legal regime that provides different default rules to people based on immutable characteristics; the privacy tradeoffs associated with the collection and use of information about individuals; and the flexibility of personalized default rules to deal with people whose personalities, values, and behaviors change over time. In some cases, these objections have significant force and caution against a full-throated embrace of personalized default rules. In other instances, however, we show how personalized default rules can be structured so as to mitigate potential downsides.

Part IV shows how the same arguments for personalized default rules also buttress the case for personalized disclosure to consumers and citizens. The present regime uses distinctly twentieth-century technologies to disclose risks, side effects, and tradeoffs to consumers and citizens. In the modern era, there is little reason to rely on these antiquated, impersonal forms of disclosure. Instead, we propose a regime of "personalized disclosure" whereby data about individual preferences, characteristics, and predilections would be employed to improve the signal-to-noise ratio of disclosures concerning products and services. Under such a regime, pregnant women would be shown prominent warnings likely to be of greatest interest to them, and septuagenarian men would likewise see only the warnings of greatest interest to them. While this is how a family physician or small-town pharmacist has historically disclosed warnings to a well-known patient, it is not the way disclosure generally works for consumer products or medical services. Our insight is that the powerful existing critiques of disclosure remedies are not critiques of disclosure as such but rather of *impersonal* disclosure. Personalized disclosure is becoming increasingly achievable in the modern era, and we provide some initial thoughts on how it might be accomplished. Indeed, we believe more broadly that personalized disclosures and personalized default rules—and even personalized law in general—will become essential tools in legal regulators' quivers in the coming decades. We even posit that personalized disclosure can ameliorate some of the complexity problems associated with a shift toward personalized default rules. The ills of personalization, it turns out, may be countered by even more personalization.

I.   Theories of Personalized Default Rules

Default rules regulate much of our lives. Any transaction in which consumers, merchants, employees, employers, tenants, or landlords engage will be governed by default rules. Unsurprisingly, some commentators have suggested that one of the main goals of contract law is to reduce transaction

costs by providing contracting parties with default rules that apply to their transactions unless they explicitly or implicitly reject them.[15]

Default rules also regulate what happens after people die. When people die intestate (without a will), default rules prescribed by inheritance law allocate the estate among the heirs in a certain manner.[16] An individual may opt out of the default intestacy rules by leaving a will that allocates the estate differently among the heirs, but as long as she does not do so, the default rules prevail. Since many people die intestate, the content of the default rules is of the utmost importance. Here, the default rules are particularly "sticky"[17] because biases and cognitive constraints prevent people from contemplating their future death.[18] In this situation, therefore, the transaction costs associated with creating a will can be high.

Under the most influential default-rule theory, which we discuss in detail below,[19] default rules are aimed at decreasing transaction costs. In order for default rules to achieve this goal, they should generally track most people's preferences and desires. If default rules do not satisfy this condition, they would increase—rather than decrease—transaction costs since most parties would opt out, which is costly. Furthermore, sometimes parties would not opt out of undesirable default rules because opting out is too costly, and therefore they would be governed by rules they would have never chosen in the absence of transaction costs. Finally, sometimes transaction costs prevent deals from being struck where a meeting of the minds would have occurred but for those costs; thus, providing the parties with default rules they prefer would reduce transaction costs and potentially facilitate deals.

Default rules governing specific types of transactions should be tailored until finer tailoring is not cost justified, i.e., when additional tailoring will increase transaction costs.[20] Although default rules are everywhere, their

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15.   *See, e.g.*, Robert Cooter & Thomas Ulen, Law and Economics 341 (6th ed. 2012) ("Default rules fill gaps in contracts in order to reduce transaction costs."); Steven Shavell, Foundations of Economic Analysis of Law 302 & nn. 13–14 (2004) (arguing that in order to reduce writing costs, courts should complete gaps in contracts using rules that are most likely to be desired by the parties).

16.   *See, e.g.*, Cal. Prob. Code § 6400 (West 2009); Conn. Gen. Stat. § 45a-437 (2013); Me. Rev. Stat. tit. 18-A, § 2-101 (2012).

17.   *See* Omri Ben-Shahar & John A.E. Pottow, *On the Stickiness of Default Rules*, 33 Fla. St. U. L. Rev. 651 (2006) (using the term "sticky" to define default rules in settings where the default rule is rarely changed due to high transaction costs or for other reasons, such as fear of unknown contract provisions).

18.   Adam J. Hirsch, *Text and Time: A Theory of Testamentary Obsolescence*, 86 Wash. U. L. Rev. 609, 636 (2009) ("But a testator's failure to consider the risk of premature death is entirely plausible, psychologically.").

19.   *See infra* Section I.B.1.

20.   This is a necessary implication of the economic argument that "[t]he fewer the terms requiring negotiation, the cheaper is the contracting process." Cooter & Ulen, *supra* note 15, at 293. *But see* Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 Yale L.J. 87, 117–18 (1989) (arguing that adopting tailored rules to

prominent role in contracting is particularly well understood. The next sections focus on the personalization of contract default rules, while later in the Article we apply our insights to other default rules as well.

A. *Contract Law Default Rules*

If contracting parties were required to agree on all the terms of their contracts, negotiation would be endless, drafting costs would skyrocket, and many efficient contracts currently executed would never result in meetings of the mind. Contract law thus provides the parties with numerous default rules that become part of their contracts unless the parties implicitly or explicitly reject them.[21] For instance, under section 2-308 of the Uniform Commercial Code ("U.C.C."), "[u]nless otherwise agreed . . . the place for delivery of goods is the seller's place of business or if none, the seller's residence."[22] The parties hence do not need to agree beforehand on the place of delivery, since as long as they do not say otherwise, delivery would occur at the seller's place of business. And section 2-314 of the U.C.C. maintains that "[u]nless excluded or modified . . . a warranty that the goods shall be merchantable is implied in a contract for their sale if the seller is a merchant with respect to goods of that kind."[23] The U.C.C. then clarifies in detail what merchantability means.[24] As a result, parties to a sale contract need not explicitly agree that the goods sold should be merchantable if the seller is a merchant; they also do not need to define what merchantability means—the law does it for them.

Remedies for breach of contract can be understood as another important source of default rules. While expectation damages are the default rule, the parties may agree otherwise, for example, by excluding or limiting liability for consequential losses or by incorporating a liquidated damages clause into their contracts.[25] Indeed, the parties' power to opt out of the "full compensation" default rule is limited: courts can strike down a liquidated

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fill gaps in the contract creates costs of distinguishing different types of parties and transactions); Ayres, *supra* note 9 (arguing that when a decisionmaker creates a tailored default rule, she should account for both precision and complexity).

21.   Cooter & Ulen, *supra* note 15, at 293 ("When a court imputes terms to fill in a contract, the implicit terms apply by *default*, which means 'in the absence of explicit terms to the contrary.'"); Shavell, *supra* note 15, at 302 & nn.13–14 (arguing that when parties leave gaps in the contract, courts should fill these gaps by adopting an interpretive method that minimizes the sum of writing costs and the costs of errors in the interpretation).

22.   U.C.C. § 2-308 (2013).

23.   *Id.* § 2-314.

24.   *Id.* § 2-314(2) (detailing the conditions under which goods are considered merchantable).

25.   Restatement (Second) of Contracts § 356 (1981) (stating that the parties can decide in advance the amount of damages payable in case of breach and that such an agreement replaces the court's inquiry about the correct level of damages); E. Allan Farnsworth, Contracts § 12.18 (4th ed. 2004) (stating that parties can agree on remedial rights different from the remedies usually supplied by the courts).

damages clause as a penalty[26] or use the doctrine of unconscionability to refuse to enforce exclusionary clauses in consumer contracts, especially when such clauses exempt the merchant from liability for bodily injury.[27]

B.   *Majoritarian Default Rules*

1.   In General

Under the majoritarian default-rules theory, which is the most accepted and influential theory among law-and-economics theorists, a default rule should mimic the term that the majority of the parties to whom it applies would have agreed on had they considered it as an option when making their contract.[28] Thus, if most contracting parties in a sales contract prefer delivery of the goods to occur at the seller's place, section 2-308 of the U.C.C. is the appropriate default rule. The logic behind the majoritarian default-rules theory is simple: since default rules aim to decrease transaction costs, they should fit the parties' preferences as closely as possible. There would always be some parties that prefer a rule different from the one preferred by the majority, and these parties would then have to opt out of the default rule and incur the attendant transaction costs. But the majority of parties would not opt out, thereby avoiding the transaction costs they would have incurred in the absence of the default rule.[29]

A central question for the majoritarian theory is how to predict most parties' preferences. Do most parties to sales contracts prefer delivery of the goods at the seller's or the buyer's place? Do they prefer expectation damages or maybe just reliance damages? Law-and-economics scholars contend that most contracting parties want their contracts to reduce costs and increase benefits, thereby increasing the surplus of their contract, which they can divide among themselves.[30] The majoritarian default rule should therefore be efficient. Thus, according to this view, if in most cases the costs of

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26.   RESTATEMENT (SECOND) OF CONTRACTS § 356 (stating that the parties' power to set liquidated damages is limited and that the liquidated damages provision must regard the principle of compensation); FARNSWORTH, *supra* note 25, § 12.18 (stating that parties' power to bargain over remedial rights is limited by the principle of compensation, which means that the stipulated sum cannot be significantly larger than the amount required to compensate the injured party for its loss).

27.   U.C.C. § 2-719(3) ("Limitation of consequential damages for injury to the person in the case of consumer goods is prima facie unconscionable.").

28.   COOTER & ULEN, *supra* note 15, at 293–94 (arguing that courts should impute to the parties the terms in the contract that the parties would have agreed on had they negotiated the term in advance); David Charny, *Hypothetical Bargains: The Normative Structure of Contract Interpretation*, 89 MICH. L. REV. 1815, 1820–23 (1991) (arguing that default rules should be the most likely result of a hypothetical bargaining between the parties).

29.   COOTER & ULEN, *supra* note 15, at 294 (arguing that the efficient default rule is preferable because most parties would not wish to opt out, which would save transaction costs).

30.   Richard R.W. Brooks & Alexander Stremitzer, *Remedies On and Off Contract*, 120 YALE L.J. 690 (2011) (arguing that the remedy of rescission followed by restitution is socially desirable and that the parties to the contract would want it ex ante, since it incentivizes them

delivery at the seller's place of business are lower than at the buyer's, section 2-308 of the U.C.C. is an efficient default rule. Similarly, if full expectation damages provide more efficient incentives to the parties to perform the contract and reduce expected losses compared to reliance damages, an expectation damages default rule is superior to a reliance damages default rule.[31] Note that one need not be efficiency oriented to adopt the majoritarian default-rule theory; this theory is committed to one notion only—the default rule should mimic the majority of the parties' preferences, whatever these preferences are.[32]

Default rules can be context sensitive, which is a nod in the direction of personalization.[33] Thus, even if a damages default rule is better than a specific performance default rule *in total*—since most contracting parties would prefer the former remedy to the latter—this might not be true in specific situations or with certain types of contracts. While the more common remedy under American contract law is damages,[34] when the contract is for the sale of a unique good, courts are often willing to grant a remedy of specific performance.[35] Instead of having one default rule on the choice between damages and specific performance for all contracts, there are two different default rules: one for selling unique goods and another for other contracts. But the default rules could be—and indeed they are—even more specifically

to invest in the contract to the level that maximizes the joint surplus); Richard A. Posner, *The Law and Economics of Contract Interpretation*, 83 Tex. L. Rev. 1581, 1588 (2005) ("Each party [to the contract] wants to maximize his gain from the transaction, and that is usually best done by agreeing to terms that maximize the surplus created by the transaction—the excess of benefits over costs, the excess being divided between the parties.").

31.   *See* Cooter & Ulen, *supra* note 15, at 287–89 (arguing that expectation damages usually give better incentives to the promisor and therefore are superior to reliance damages); Steven Shavell, *Damage Measures for Breach of Contract*, 11 Bell J. Econ. 466 (1980) (arguing that full expectation damages provide efficient incentive to parties to perform and thus fill gaps in the contract that involve unlikely future contingencies); Steven Shavell, *Why Breach of Contract May Not Be Immoral Given the Incompleteness of Contracts*, 107 Mich. L. Rev. 1569, 1573–74 (2009) (arguing that the promisor's option to breach and pay expectation damages is a default rule incorporated into an incomplete contract).

32.   *See* Omri Ben-Shahar, *A Bargaining Power Theory of Default Rules*, 109 Colum. L. Rev. 396 (2009) (arguing that some default rules have a distributive, rather than an efficiency, effect, and proposing criteria for giving these default rules content); Richard Craswell, *Contract Law, Default Rules, and the Philosophy of Promising*, 88 Mich. L. Rev. 489 (1989) (explaining how nonefficiency theories of contract law could be the source of default rules but arguing that efficiency is the much better source).

33.   *See* Ayres, *supra* note 9 (arguing that when a decisionmaker creates a tailored default rule, she should find the optimal point at which the rule is specific enough but not too complex); Geis, *supra* note 10 (modeling the simplicity–complexity dimension of default rules and suggesting that under certain assumptions a simpler, although less accurate, default rule would better reduce transaction costs).

34.   Farnsworth, *supra* note 25, § 12.8 (stating that the award of damages, measured by the injured party's expectation, is the common form of relief for breach of contract).

35.   Anthony T. Kronman, *Specific Performance*, 45 U. Chi. L. Rev. 351, 355–56 (1978) (stating that courts typically grant specific performance in contracts for the sale of a "unique" item, such as the sale of land, antiques, and patent rights); Alan Schwartz, *The Case for Specific Performance*, 89 Yale L.J. 271, 272–74 (1979) (same).

tailored. And at least from an economics perspective, they should be tailored until the point where additional tailoring is no longer cost justified.[36] A related issue also arises with personalized default rules.[37]

2.   Personalized Majoritarian Default Rules

Default rules are often tailored for different types of transactions or contexts. But as far as we can tell, they are usually not tailored to the personal characteristics of the parties.[38] Consider the following example:

> *Example 1. Place of delivery.* Dan is a disabled consumer who uses a wheelchair for mobility. He purchases a large-screen television from an electronics store. Should the default place of delivery be the seller's or the buyer's place?

Even if for most consumer contracts the efficient rule is delivery at the seller's place, this is not necessarily the case in Example 1. The personally tailored default rule for consumers who use wheelchairs, and who can be easily identified as using a wheelchair, would typically be delivery at the buyer's place, since such delivery would reduce the parties' total costs and would therefore be their preferred option.[39] Indeed, with such a default rule, a seller would probably be able to charge the disabled buyer a premium for delivery. And needless to say, either party should be able to opt out of the personalized default rule if he wishes. But as long as neither does so, delivery at the buyer's place in Example 1 could be a better default rule than the rule commonly applied to buyers who are not disabled.[40] Now consider a more complicated example:

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36.   Ayres, *supra* note 9, at 7–9 (arguing that since more tailoring creates complexity and uncertainty, the decisionmaker needs to tailor the rule up to the point where these costs outweigh the reduction in transaction costs).

37.   Personalized default rules raise the issue of what level of additional tailoring is no longer cost justified given the possible tradeoff between accuracy and certainty. *See infra* Section III.D.

38.   In the U.C.C., there is a distinction between merchants and nonmerchants (U.C.C. § 2-104(1) (2013) defines a merchant), and some of the Code's terms offer customized rules for merchants. *See, e.g.*, U.C.C. § 2-314 (imposing higher warranty standards by default on merchant sales). Some commentators have advocated for different rules of interpretation for sophisticated and nonsophisticated parties. *See, e.g.*, Alan Schwartz & Robert E. Scott, *Contract Theory and the Limits of Contract Law*, 113 Yale L.J. 541, 569–70 (2003) (arguing that sophisticated parties prefer textualist interpretation of contracts).

39.   *See* Shields v. Walt Disney Parks & Resorts US, 279 F.R.D. 529 (C.D. Cal. 2011). In a motion for class certification, plaintiffs, all visually impaired visitors of the Disney resorts in California, alleged that defendants discriminated against them. *Id.* at 540. One of the arguments was that the defendant's audio description devices were designed to shut off automatically after a given time and could not be reset by visually impaired users. *Id.* The court analyzed this argument in terms of the device's potential design defects. *Id.* at 550. One could argue that most users preferred the automatic shutdown, thus making it the majoritarian default rule, while the plaintiffs were seeking to impose on the defendant a personalized default rule for visually impaired visitors.

40.   Business practices in American grocery stores track this default rule to some extent. A grocery bagger is likely to ask an elderly customer with a large order whether she would like

> *Example 2. Specific performance or damages.* Steven is a classic rational actor. He feels no personal attachment to property and changes his residence quite often. Sarah holds Kantian moral values regarding keeping one's promises, feels personal attachment to property, rarely changes her place of residence and, when she does, she spends months searching for the perfect place. Both Steven and Sarah entered into (separate) contracts to purchase homes from John, who is a merchant in the business of selling homes. John breaches both contracts by failing to deliver possession and title, and the question of the adequate remedy arises. Assuming everything else about the contracts is equal, except the parties' characteristics, should the court order the same remedy for Steven and Sarah?

Under current law, the answer is typically yes. A possible qualification is that if John could have reasonably understood while negotiating the contracts with Steven and Sarah that Steven preferred a damages remedy and Sarah preferred specific performance, the court may take John's understanding into account in choosing the appropriate remedy. We argue that under the assumption that John and the courts can verify the parties' characteristics, a court ought to award damages to Steven and grant specific performance to Sarah. Indeed, John may price the contract differently for Steven and Sarah, or at least offer them different contractual terms, which would balance the additional costs that specific performance entails for the seller.

C. *Minoritarian (or Penalty) Default Rules*

1. In General

In a seminal article published in 1989, Ian Ayres and Robert Gertner identified a second type of default rule, which they called the "Penalty Default Rule."[41] Unlike the majoritarian default rule, the penalty default rule is not aimed at mimicking the contractual term most parties prefer but instead at penalizing the party who has private information that the other party does not have. Such a penalty is designed to incentivize the party with private information to reveal this information to the party without it, thereby facilitating an efficient contract.[42]

An example penalty default rule used by Ayres and Gertner was the foreseeability requirement of *Hadley v. Baxendale*.[43] Under this requirement,

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assistance unloading groceries into her car, but he would probably not bother asking the same question to a twenty-year-old who has purchased a box of corn flakes and a magazine.

41. Ayres & Gertner, *supra* note 20, at 91 ("Penalty defaults [are defaults that] are designed to give at least one party to the contract an incentive to contract around the default rule and therefore to choose affirmatively the contract provision they prefer.").

42. On other occasions, a penalty default rule would penalize both parties for concealing information that makes the determination of their dispute easier for courts; in this way, Ayres and Gertner explain the then–U.C.C. § 2-201 zero-quantity provision, under which, if the parties have not agreed on the quantity, the courts would not fill in this gap and would not enforce the contract. *Id.* at 95–100 & n.43.

43. Hadley v. Baxendale, (1854) 156 Eng. Rep. 145; 9 Ex. 341.

the aggrieved party is only entitled to compensation for foreseeable losses. Ayres and Gertner explain that without the foreseeability limitation on liability, an aggrieved party with unforeseeable losses would hide this information from the other party.[44] The foreseeability limitation penalizes an aggrieved party who hides the information by barring recovery for his unforeseeable losses in case of a breach.[45] In particular, if the aggrieved party is not the cheapest cost avoider or the cheapest insurer of his unforeseeable losses, he would disclose the potential losses to the other party. This disclosure renders the losses foreseeable, and the other party would take them into account in deciding whether to enter into the contract, how much to invest in precautions, and whether to perform or breach.[46]

Commentators criticize Ayres and Gertner's penalty default-rules theory from several angles. They argue that a penalty default rule would not necessarily force a contracting party to reveal private information because such a move might directly contradict its bargaining strategy[47] or because the party might benefit from being pooled together with other parties, which could allow it to externalize costs to them.[48] Eric Posner prominently argues that there are no penalty default rules in contract law, nor should there be any.[49] This is because both majoritarian default rules and penalty default rules force contracting parties with private information, who prefer to opt out of the default rule, to reveal their private information to the other party, who would offer them a different contract in exchange.[50] Opting out is costly, so a majoritarian default rule would function better than a penalty default rule, since it encourages fewer parties to opt out. It is possible that the minority's total costs of opting out would exceed the majority's total costs of doing so, but this is an unlikely scenario.[51]

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44.   Ayres & Gertner, *supra* note 20, at 101–04.

45.   *Id.* (arguing that the decision in *Hadley* is an example of a penalty default rule).

46.   *See* Richard Craswell, *Contract Remedies, Renegotiation, and the Theory of Efficient Breach*, 61 S. Cal. L. Rev. 629 (1988) (describing the various stages where the promisor makes decisions affecting the likelihood of breach); Thomas S. Ulen, *The Efficiency of Specific Performance: Toward a Unified Theory of Contract Remedies*, 83 Mich. L. Rev. 341 (1984) (describing different remedies for breach of contract and examining when parties may take them into account).

47.   Jason Scott Johnston, *Strategic Bargaining and the Economic Theory of Contract Default Rules*, 100 Yale L.J. 615, 617 (1990) (arguing that the *Hadley* default penalty rule will not incentivize promisees to reveal private information since revealing the value the promisee ascribes to the contract with the promisor would allow the promisor to raise the contract price substantially).

48.   Barry E. Adler, *The Questionable Ascent of* Hadley v. Baxendale, 51 Stan. L. Rev. 1547, 1551 (1999) (arguing that parties with private information would not reveal their types when they benefit from the cross subsidization entailed by pooling them with other parties).

49.   Eric A. Posner, *There Are No Penalty Default Rules in Contract Law*, 33 Fla. St. U. L. Rev. 563, 586–87 (2006).

50.   *Id.* at 569–73.

51.   *Id.* at 573 (arguing that examples of penalty default rules are either not default rules at all or can be explained by the majoritarian default-rule theory); *see also* Lucian Ayre

We might better understand a penalty default rule as a species of mi-
noritarian default rule, as Ayres and Gertner in fact acknowledge in an essay
they published a decade after they first proposed the penalty default-rule
idea.[52] We believe that at least as personalized default rules are concerned,
there could be minoritarian default rules, as we explain more fully below.
But we also suspect that the rise of Big Data (described in Part II) will make
penalty default rules less important, since firms are gaining access to a trea-
sure trove of information about individual consumers.

2. Minoritarian Default Rules as Facilitators of Personalized Default Rules

Minoritarian default rules could facilitate personalized majoritarian de-
fault rules. If sellers and courts have full information about buyers, default
rules aimed at forcing buyers to reveal private information will be meaning-
less. Sellers and courts, however, often do not have full information about
buyers' preferences, characteristics, and traits, and *personally* tailoring de-
fault rules for them seems impractical. A default rule would encourage buy-
ers to reveal their preferences, characteristics, and traits to sellers, either for a
specific transaction or for many future transactions, by penalizing those
buyers who could cheaply convey such information yet fail to do so.

Consider again Example 2 (Specific performance or damages). Suppose
sellers and courts cannot distinguish accurately between Steven and Sarah,
and therefore it is impossible to tailor personalized default rules. Neverthe-
less, a default rule of damages could still change the outcome. If Sarah is
aware of the damages default rule, she will reveal her preferences for specific
performance to the seller or, alternatively, reveal her characteristics and
traits to him, from which he would be able to deduce that unless they agree
otherwise, her remedy will be specific performance. Thus, the damages de-
fault rule will penalize Sarah if she does not convey information to the seller
about her preferences or characteristics.

Could specific performance function in the same way? Under a specific
performance default rule, Steven would arguably reveal neither his prefer-
ence for damages nor his characteristics and traits because he is no worse off
with specific performance than with a damages remedy. Although he is in-
different about the remedy, he may be better off with specific performance,

Bebchuk & Steven Shavell, *Reconsidering Contractual Liability and the Incentive to Reveal Infor-
mation*, 51 Stan. L. Rev. 1615, 1619–26 (1999) (assessing the *Hadley* default rule of limited
liability and arguing that the rule entails some costs in different situations and should be
adopted only where the parties would have most likely wanted it in advance, which makes it a
majoritarian default rule); Johnston, *supra* note 47, at 622–23 (arguing that the *Hadley* rule
might be preferable to the parties ex ante and thus not a penalty rule).

52. Ayres & Gertner, *supra* note 9, at 1600–02, 1606 (explaining that the penalty default
rule is one type of minoritarian default rule, which is efficient when it is less costly for the
majority to opt out than it is for the minority to do so).

since it would improve his bargaining position vis-à-vis the seller's, for whom specific performance is typically more burdensome.[53]

But this analysis is incomplete. If the seller is able to structure the contract to reward buyers who are entitled to the less burdensome remedy, then both damages and specific performance could function effectively to force buyers to reveal their preferences, characteristics, and traits. Specifically, while a damages default rule would penalize Sarah ex post if she does not reveal her preferences or characteristics, specific performance would penalize Steven ex ante (higher price or less favorable contractual terms) if he does not reveal his preferences or characteristics. The choice between damages and specific performance should therefore hinge on the empirical question of who bears the lower costs in revealing their preferences or characteristics: Steven or Sarah? If the answer is Steven, specific performance should be the more efficient default rule, and if it is Sarah, damages should be the most efficient default rule. If there are more "Stevens" than "Sarahs" among buyers but it is much less costly for the "Stevens" than for the "Sarahs" to reveal their preferences or characteristics, specific performance could be the efficient (minoritarian) default.

Under our personalized default-rules theory, parties do not directly negotiate the terms of the contract but instead reveal information about their characteristics and traits, which in turn affects the contents of the default rules applied to them. This information could often be private and even confidential: not every sensitive, neurotic buyer would like to reveal these attributes to a seller. In other words, for some types of characteristics and traits, the default rules could be stickier than for others, and the people possessing the former characteristics and traits could be the minority. In the same way, some types of parties may have significant cognitive limitations or biases that would make it especially burdensome to reveal private information about their preferences, and these parties could be the minority. In such a situation, a minoritarian default rule could similarly work better than a majoritarian one.

D.   *Third-Party Effects*

The third approach to determining the content of default rules requires that the rules maximize social welfare generally, not just the welfare of the contracting parties. Contract law often takes *negative* effects on third parties as a central consideration in enforcing contracts. For example, an entire chapter of the *Restatement (Second) of Contracts* is dedicated to "Unenforceability on Grounds of Public Policy."[54] This chapter, however, is not about default rules but instead about mandatory, immutable rules: naturally, the

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53.   *See* Craswell, *supra* note 46, at 636–38 (noting that specific performance, like overcompensatory remedies, has the potential to discourage efficient breaches); Schwartz, *supra* note 35, at 274 (arguing that if damages are fully compensatory, adding the option of specific performance creates an opportunity for the promisee to exploit the promisor by threatening to compel performance when costs of performance are higher than the damages).

54.   Restatement (Second) of Contracts § 178–199 (1981).

parties are not allowed to opt out of these rules. Contract law doctrines, however, only rarely take into account positive effects on third parties,[55] and externalizing benefit default rules are rare.[56]

In some instances, the personalization of default rules may produce benefits to third parties, or positive externalities, and the desire to promote such externalities may convince society to embrace personalization. For example, many jurisdictions confront the dilemma of how to encourage people to donate their organs after death to save other people's lives. A possible solution is to have a default rule that is expected to be quite sticky: most people would not opt out, whatever the default rule is.[57] Assuming the social goal is to find an optimum between fulfilling people's wishes and benefiting third parties (if these benefits were the only issue, a mandatory rule of donation would be the optimal solution[58]), tailoring personalized default rules to different groups in society could be an optimal solution. Thus, if there are groups in society—say, adherents of Shintoism—who are expected to object to organ donations and would opt out of any default rule that allows them,[59] a no-donation default rule is the desirable one for them, since it would save the transaction costs of opting out. But if there are other groups in society that might weakly oppose donation but would not be willing to incur the costs of opting out, applying a default rule that is not majoritarian but balances possible donors' weak preferences against the possible recipients' strong preferences could better achieve the social goal. Indeed, rules could be personalized to benefit the interest groups that in the absence of personalization would most forcefully oppose a rule that benefits third parties. This personalization would dampen political opposition.

The discussion above highlights the applicability of our proposal for personalized default rules to any concept of default rules that attributes *at least some significance* to the preferences of the individuals making the choices. Take our inheritance example[60]: suppose that under a given legal system the decedent's preferences are not the only criterion in allocating assets, but other social goals are also considered important. As long as individuals are free to make wills, their preferences are legally significant. The law could then tailor personalized default rules that take into account people's preferences, which vary among individuals, together with social goals, which are common to everyone. Thus, individuals with strong preferences

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55. *See, e.g., id.* § 207 ("In choosing among the reasonable meanings of a promise . . . a meaning that serves the public interest is generally preferred."). *But see* Eyal Zamir, *The Inverted Hierarchy of Contract Interpretation and Supplementation*, 97 Colum. L. Rev. 1710, 1723–24 (1997) ("Despite [section 207's] broad formulation, it is assumed that this rule only applies to contracts 'which affect a public interest.'").

56. *See* Ayres & Gertner, *supra* note 9, at 1598–99 (discussing default rules that create positive externalities).

57. *See* Sunstein, *supra* note 8, at 12–13.

58. *See* Lior Jacob Strahilevitz, *The Right to Destroy*, 114 Yale L.J. 781, 807–08 (2005).

59. *See* Robert Steinbuch, *Kidneys, Cash, and Kashrut: A Legal, Economic, and Religious Analysis of Selling Kidneys*, 45 Hous. L. Rev. 1529, 1566 n.268 (2009).

60. *See supra* notes 1–5 and accompanying text.

would often make wills, and their preferences would govern the allocation of their estates. By contrast, individuals whose preferences are weaker would not make wills, and their estates would be allocated according to personalized default rules that are tailored to those people's preferences, together with the social goals that the law considers important.

II.   The Feasibility of Personalized Default Rules

Part I showed how default rules might be personalized. The discussion so far implicitly has contemplated two different sorts of personalized default rules: crude and granular default rules.

One crude personalized default rule takes a particular, observable characteristic and sorts individuals into different legal defaults based on whether they possess that characteristic. For example, if the state observes that men and women have systematically different preferences for how their estates should be divvied up among heirs, then the law might create one set of intestacy rules for men and another for women.[61] Gender is easily observable, so the costs of determining which set of intestacy rules applies will be low. Indeed, inheritance law already employs gender-sensitive *mandatory* rules, as in the case of a few state dower statutes that are designed to protect the economic interests of widows, whom legislatures perceive to be more economically vulnerable than widowers following the death of a spouse.[62] The preference-insensitive nature of these rules and their potential to reinforce stereotypes help make their persistence controversial.

When a characteristic like age or gender becomes the basis for a waivable default rule, concerns about limiting testamentary freedom disappear and antistereotyping considerations may be ameliorated. Thus, personalized default rules are already employed in some contexts. For example, some employers have implemented automatic enrollment for 401(k) retirement accounts, with a contribution level that is personalized based on the worker's age.[63] Furthermore, there are proposals to provide workers with investment vehicles that are tailored to the number of years they expect to continue working.[64] Similarly, new cars can sense the weight of a passenger in the front seat and disable the air bag to reduce the risk of injury to a lighter

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61.   Assume for present purposes that such classifications are legally permissible, although this assumption may be unreasonable. We discuss the issue further *infra* in Sections III.F–G.

62.   *See, e.g., In re* Estate of Miltenberger, 737 N.W.2d 513 (Mich. Ct. App. 2007) (rejecting equal protection challenges to Michigan's statute providing that widows—but not widowers—are entitled to at least one-third of a deceased spouse's land holdings). *But cf.* Stokes v. Stokes, 613 S.W.2d 372, 376 (Ark. 1981) (invalidating a gender-sensitive dower statute on equal protection grounds). *See generally* Joslyn R. Muller, Comment, *Haven't Women Obtained Equality? An Analysis of the Constitutionality of Dower in Michigan*, 87 U. Det. Mercy L. Rev. 533 (2010) (surveying gender-sensitive dower statutes in various states).

63.   We thank Lauren Willis for this example.

64.   *See* Gordon T. Butler, *American Paternalism and the One Fund Solution*, 9 Wyo. L. Rev. 485, 521 (2009).

passenger if the air bag is deployed in a crash.[65] We can refer to approaches that use a single variable like gender, age, or weight as the sole basis for tailoring as "crude personalized default rules."

Greater personalization is possible. Suppose that politically conservative and politically liberal women have different preferences with respect to the division of their estates. Suppose further that politically conservative women from cities and rural areas systematically differ in the way they prefer to divide their estates. In theory, there are a multitude of possible personalized default rules. Nevertheless, regularities exist, and the task of using these regularities to establish sufficiently large groups of like-minded individuals who can be assigned the same set of default rules implicates a tradeoff between precision and complexity.[66] We will refer to precise default rules that employ many characteristics about individuals—including their past behaviors in similar circumstances—to predict the contractual or testamentary terms they would have opted for as "granular personalized default rules."

The feasibility of employing crude personalized default rules is a straightforward matter. We need only show that a particular characteristic accurately predicts future behavior. That said, we will show why using crude personalized default rules is often less desirable than employing granular personalized default rules. In this Part, we therefore will focus on the feasibility of the granular defaults.

A. *Big Data and Big Five*

An apparent hurdle in creating personalized default rules is the issue of conveniently identifying relevant default rules both ex ante by the parties and ex post by the courts. Suppose a legal dispute has arisen concerning ambiguity in a contract. Once the nature and the stakes of the dispute are clear to both parties, each will have an incentive to argue that she is the type of person who ought to be entitled to the personalized default rule that would cause the court to rule in her favor. In Example 2, both Steven and Sarah will argue that they are the types of people entitled to specific performance if this remedy creates an entitlement that strengthens their bargaining position relative to John's.[67] Is there a reliable way to prevent these problems of proof? We believe that in the era of Big Data, the answer to this question is yes.

Big Data is commonly defined as the process whereby computers sift through enormous quantities of data to identify patterns that can predict

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65. N. Craig Smith et al., *Smart Defaults: From Hidden Persuaders to Adaptive Helpers* 18 (INSEAD Working Paper Series, Paper No. 2009/03/ISIC, 2009) *available at* https://flora.insead.edu/fichiersti_wp/inseadwp2009/2009-03.pdf. This proposal for "smart defaults" is similar to the "personalized defaults" approaches discussed in the legal literature, although the authors' discussion of smart defaults is quite abbreviated.

66. *See infra* Section III.D.

67. *See supra* Section I.B.2 and text accompanying note 53.

individuals' future behavior.[68] It depends on the combination of gigantic databases (typically cataloging consumer behavior) with predictive analytics. Firms spent $28 billion on Big Data in 2012, a number that was estimated to have grown to $34 billion in 2013.[69] To put this $28 billion number in perspective, it is an amount equal to the annual Gross Domestic Product of Jordan or Latvia[70] yet with greater growth potential.

What did all that money purchase? It is hard to know for sure since many uses of Big Data are being kept as proprietary trade secrets. But in the past year or two, the news media has reported on a dizzying array of industries applying the tools of Big Data. Facebook's new "graph search" feature seeks to employ the company's Big Database to better predict which search results will be most useful to individuals who type in search queries.[71] Big Data is a big industry in higher education.[72] Big Data is a big business in medicine.[73] It is all the rage in insurance.[74] Researchers have shown how they can predict an individual's race by analyzing online behavior[75] and can make accurate predictions about an individual's ideology by monitoring her television viewing habits.[76] And the campaign to reelect President Obama was lauded (and criticized) for its sophisticated use of Big Data techniques to identify and energize the president's partisans.[77] These technologies have

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68.   Lior Jacob Strahilevitz, *Toward a Positive Theory of Privacy Law*, 126 Harv. L. Rev. 2010, 2021 (2013).

69.   Nick Kolakowski, *Big Data Spending Will Hit $28 Billion in 2012: Gartner*, Slashdot (Oct. 17, 2012), http://slashdot.org/topic/bi/big-data-spending-will-hit-28-billion-in-2012-gartner/.

70.   *GDP—Countries—List*, Trading Economics, http://www.tradingeconomics.com/country-list/gdp (last visited Feb. 13, 2014).

71.   *See* Somini Sengupta & Claire Cain Miller, *Search Option from Facebook Is Privacy Test*, N.Y. Times, Jan. 19, 2013, at A1, *available at* http://www.nytimes.com/2013/01/19/technology/with-graph-search-facebook-bets-on-more-sharing.html.

72.   *See* Marc Perry, *Please Be eAdvised*, N.Y. Times, July 22, 2012, at ED24, *available at* http://www.nytimes.com/2012/07/22/education/edlife/colleges-awakening-to-the-opportunities-of-data-mining.html.

73.   *See, e.g.*, Derrick Harris, *Better Medicine, Brought to You by Big Data*, GigaOM (July 15, 2012, 6:00 AM), http://gigaom.com/cloud/better-medicine-brought-to-you-by-big-data/?utm_source=Social&utm_medium=twitter&utm_campaign=gigaom.

74.   *See* Laurie Sullivan, *Credit Ratings Aid Marketers in Targeting Ads*, Media Post News (Aug. 17, 2012, 4:29 PM), http://www.mediapost.com/publications/article/181075/credit-ratings-aid-marketers-in-targeting-ads.html#axzz2F2rHWmiH.

75.   Alistair Croll, *Big Data Is Our Generation's Civil Rights Issue, and We Don't Know It*, O'Reilly Radar (Aug. 2, 2012), http://radar.oreilly.com/2012/08/big-data-is-our-generations-civil-rights-issue-and-we-dont-know-it.html.

76.   Bill Carter, *Republicans Like Golf, Democrats Prefer Cartoons, TV Research Suggests*, N.Y. Times Media Decoder (Oct. 11, 2012, 7:42 PM), http://mediadecoder.blogs.nytimes.com/2012/10/11/republicans-like-golf-democrats-prefer-cartoons-tv-research-suggests/?smid=tw-nytimes.

77.   *See* Christi Parsons & Kathleen Hennessey, *Obama's Math Geeks Raised the Odds*, L.A. Times, Nov. 14, 2012, at A8, *available at* http://articles.latimes.com/2012/nov/13/nation/la-na-obama-analytics-20121113.

been employed to help businesses find customers who are profitable, patients who need special care, voters who are persuadable, and insureds who present good risks.[78]

Even brick-and-mortar outfits with familiar business models are using data-driven strategies to personalize service in a way that will appeal to their customers. For example, restaurants are increasingly assembling dossiers on customers to enable them to remember whether particular patrons prefer black or white napkins and red or white wine.[79] This information can then be shared with partner restaurants via Opentable.com's reservation database.[80] With the benefit of this data, savvy restaurants can provide a first-time diner with the same sort of personalized service that regulars from the neighborhood have long come to expect.

Law is perhaps the primary major industry in which the effects of Big Data have not been widely documented, although that is beginning to change, according to a recent article by Daniel Katz.[81] Katz identifies many applications of Big Data to the legal profession, suggesting its utility in predicting legal costs at the outset of a case, predicting outcomes in litigation, helping firms hire the right attorneys, and managing the discovery process.[82] Our proposal suggests a different way in which the legal system can leverage the benefits of Big Data. Under certain circumstances, we want the courts (and advocates in the courtroom) to embrace the science of Big Data as a means of deciding what terms ought to be imported into an ambiguous contract or will. Furthermore, we propose that parties often would be able to use Big Data to predict beforehand what default rules will be applied to their contracts. We later explain in more detail how that would work, but before we do so, a few more words on Big Data and the "Big Five" personality characteristics are in order.

Journalists writing about Big Data have spilled much more ink discussing its proliferation than what makes it effective. At bottom, we believe a major reason why Big Data enables firms and government entities to predict future behavior is that patterns of purchases, mouse clicks, credit payments, and social network ties reveal fundamental aspects of individuals' personalities and values.[83]

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78. *See, e.g.*, Natasha Singer, *Shoppers, Meet Your Scorekeeper*, N.Y. Times, Aug. 19, 2012, at BU1, *available at* http://www.nytimes.com/2012/08/19/business/electronic-scores-rank-consumers-by-potential-value.html (profiling eBureau, a technology company that uses data mining to determine which individuals are likely to be profitable customers for firms).

79. Susanne Craig, *Getting to Know You*, N.Y. Times, Sept. 5, 2012, at D1, *available at* http://www.nytimes.com/2012/09/05/dining/what-restaurants-know-about-you.html?pagewanted=all&_r=0.

80. *Id.*

81. Daniel Martin Katz, *Quantitative Legal Prediction—or—How I Learned to Stop Worrying and Start Preparing for the Data-Driven Future of the Legal Services Industry*, 62 Emory L.J. 909 (2013).

82. *Id.*

83. Strahilevitz, *supra* note 68, at 2022–24.

Psychologists understand human behavior largely in terms of the Big Five personality characteristics: extraversion, euroticism, agreeableness, conscientiousness, and openness.[84] An enormous psychological literature has identified ways in which particular personality traits are more pronounced among people who engage in particular sorts of behaviors.[85] For example, people who score highly on extraversion are more likely to disclose information about themselves on social networks,[86] and people who score highly on conscientiousness are more likely to be politically conservative.[87] Other research suggests that American college students score noticeably higher on personality tests measuring agreeableness than do their Western European counterparts.[88] The Big Five is not the only valid framework for assessing personality. Various psychologists have categorized different dimensions of personality, such as authoritarian personality traits,[89] which we will address in turn.[90]

By employing Big Data, firms have found a substitute for administering complex personality tests to each potential customer to identify her quirks and predilections.[91] Because these firms are using publicly available data and proprietary data that is bought and sold in the marketplace, they can dispense with obtaining the consent of the individuals whose behavior they are studying. Moreover, because they will be studying a consumer's revealed preferences rather than her responses to surveys (which might be slanted in

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84. Murray R. Barrick & Michael K. Mount, *The Big Five Personality Dimensions and Job Performance: A Meta-Analysis*, 44 Personnel Psychol. 1, 1–5 (1991).

85. The legal literature employing the Big Five analysis in a sophisticated way, by contrast, is relatively sparse. For examples of successful interdisciplinary work of this sort, see Stuart P. Green & Matthew B. Kugler, *When Is It Wrong to Trade Stocks on the Basis of Non-Public Information? Public Views of the Morality of Insider Trading*, 39 Fordham Urb. L.J. 445 (2011), and Margaret C. Stevenson & Tracy L. Caldwell, *Personality in Juror Decision-Making: Toward an Idiographic Approach in Research*, 33 Law & Psychol. Rev. 93 (2009). Although it characterizes individuals in a way that diverges somewhat from the Big Five framework, the Cultural Cognition Project has done the most influential legal work applying research about personality heterogeneity to legal problems. *See, e.g.*, Dan M. Kahan et al., *Cultural Cognition and Public Policy: The Case of Outpatient Commitment Laws*, 34 Law & Hum. Behav. 118 (2010).

86. Baiyun Chen & Justin Marcus, *Students' Self-Presentation on Facebook: An Examination of Personality and Self-Construal Factors*, 28 Computers in Hum. Behav. 2091, 2097 (2012); Tracii Ryan & Sophia Xenos, *Who Uses Facebook? An Investigation into the Relationship Between the Big Five, Shyness, Narcissism, Loneliness, and Facebook Usage*, 27 Computers in Hum. Behav. 1658, 1662 (2011).

87. Dana R. Carney et al., *The Secret Lives of Liberals and Conservatives: Personality Profiles, Interaction Styles, and the Things They Leave Behind*, 29 Pol. Psychol. 807, 824 (2008).

88. David P. Schmitt et al., *The Geographic Distribution of Big Five Personality Traits*, 38 J. Cross-Cultural Psychol. 173, 185 tbl.2 (2007).

89. *See, e.g.*, John Duckitt, *Authoritarianism and Group Identification: A New View of an Old Construct*, 10 Pol. Psychol. 63 (1989).

90. *See infra* Section II.B.2.

91. Strahilevitz, *supra* note 68, at 2023.

ways the consumer believes will benefit her), firms may justifiably view the results of these quasipersonality tests as particularly reliable metrics.

To be sure, we are not suggesting that the Big Five research unlocks every behavioral mystery—the extant data suggest otherwise.[92] Rather, our more modest claim is that personality profiling identifies many powerful tendencies among individuals and groups. Personality's causal role in determining human behavior might also help alleviate some of the "black-box" concerns about Big Data's use. Without some theory of why a consumer's decision to purchase a particular product at Time 1 helps explain that same consumer's creditworthiness at Time 2, there is a greater risk that the correlation between Time 1 and Time 2 behaviors is spurious and will not be useful in prediction.[93] Worse yet, an unexplained, black-box correlation might be driven by considerations that the legal system has chosen to render illegitimate.[94]

A fascinating article by Gokul Chittaranjan, Jan Blom, and Daniel Gatica-Perez shows the promise and potential of using data mining to identify individuals' personality profiles.[95] These three scholars administered personality tests to scores of Swiss smartphone users and then monitored the users' smartphone activity over the next seventeen months. They found many significant correlations between particular personality traits and observed smartphone behavior. If you have a person's cell-phone data and you know what to look for, you know a lot about what makes her tick. Along the way, the tests showed that as a practical matter, it is easy to analyze automatically smartphone usage data to predict the personalities of individual phone users. The scholars summarized some of their main findings as follows:

> The results clearly show that several aggregated smart-phone usage features could be predictive of the Big-Five personality traits . . . . It was found that extraverts, who are characterized by talkativeness and outgoing nature, were more likely to receive calls and also spend more time on them . . . . Agreeableness among females was associated with an increase in the number of incoming calls. Agreeable males were found to communicate with more number of unique contacts through voice calls. On the other hand, conscientiousness was associated with higher usage of the Mail app, that could be used in a professional context, and with lower usage of the Youtube application, which is likely to be used for entertainment purposes. Conscientious users were also likely to contact lesser number of unique people through voice calls. This conforms with their characterization in the literature as responsible and organized individuals. Interestingly, emotional

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92. *See, e.g.*, Stevenson & Caldwell, *supra* note 85, at 110–11.

93. *Cf.* Anya Bernstein, *The Hidden Costs of Terrorist Watch Lists*, 61 Buff. L. Rev. 461, 473–74 (2013) (discussing related problems in the context of governmental use of Big Data to predict national security threats).

94. *See* Omer Tene & Jules Polonetsky, *Judged by the Tin Man: Individual Rights in the Age of Big Data*, 11 J. on Telecomm. & High Tech. L. 351, 366 (2013).

95. Gokul Chittaranjan et al., *Mining Large-Scale Smartphone Data for Personality Studies*, 17 Pers. & Ubiquitous Computing 433 (2013).

stability was linked to higher incoming SMS. And high openness was asso-
ciated with increased usage of Video/Audio/Music apps in females and also
with the usage of nonstandard calling profiles such as *Beep* and *Ascending*
in the entire population.[96]

This is an extraordinarily rich set of findings, and it suggests that Verizon,
AT&T, Apple, Samsung, and other major firms in the cell-phone industry
possess a treasure chest of personal information about their customers. Yet
legal scholars have ignored their research. A follow-up Big Data project, in
which a team of researchers from the Massachusetts Institute of Technology
and the University of Trento analyzed social network ties and personalities of
cell-phone users, suggests that in many respects behavioral data from
smartphones can better predict individuals' personalities than personality
surveys themselves.[97] This research confirms that behavioral data can predict
personality, and we already know from the psychology literature that per-
sonality can predict behavior. The iPhones, not the eyes, turn out to be the
windows into the soul. Is it any wonder that Google has gotten into the
business of making its own cell phone?[98]

Smartphones are not the only Big Data tool that researchers can use to
unlock individuals' personality scores. In the last few years, there has been
an explosion of research using the same tools to discern Big Five personality
traits from social media usage data.[99] Researchers at Microsoft and Cam-
bridge University produced a thorough working paper in which they de-
velop a model that can predict 33% of the variation in extraversion, 26% of
the variation in neuroticism, and 17% of the variation in conscientiousness
through automated analysis of individuals' Facebook activity.[100] Evidently,
what is true of smartphones is true of social networking platforms. And as

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96.   *Id.* at 449.

97.   Jacopo Staiano et al., *Friends Don't Lie: Inferring Personality Traits from Social Net-
work Structure*, U. Trento Department Info. Engineering & Computer Sci. (Sept. 2012),
http://disi.unitn.it/~staiano/pubs/SLAPSP_UBICOMP12.pdf ("[W]e believe that our results
have provided compelling evidence that mobile phones-based behavioral data can be superior
to survey ones for the purposes of personality classification.").

98.   David Pogue, *Look Ma! A No-Hands Smartphone!*, N.Y. Times, Aug. 7, 2013, at B1,
available at http://www.nytimes.com/2013/08/07/technology/personaltech/the-moto-x-from-
google-iphones-latest-challenger.html?pagewanted=all.

99.   *See, e.g.*, David John Hughes et al., *A Tale of Two Sites: Twitter vs. Facebook and the
Personality Predictors of Social Media Usage*, 28 Computers in Hum. Behav. 561 (2012); Lin
Qiu et al., *You Are What You Tweet: Personality Expression and Perception on Twitter*, 46 J. Res.
Personality 710 (2012); J. William Stoughton et al., *Big Five Personality Traits Reflected in Job
Applicants' Social Media Postings*, 16 Cyberpsychology, Behav. & Soc. Networking 800
(2013); Golnoosh Farnadi et al., *Recognizing Personality Traits Using Facebook Status Updates*,
Proc. Seventh Int'l AAAI Conf. on Weblogs & Soc. Media 14 (2013); Daniele Quercia et
al., *Facebook and Privacy: The Balancing Act of Personality, Gender, and Relationship Currency*,
Proc. Sixth Int'l AAAI Conf. on Weblogs & Soc. Media 306 (2012).

100.   Yoram Bachrach et al., *Personality and Patterns of Facebook Usage*, Proc. 3rd Ann.
ACM Web Sci. Conf. 24 (2012).

the world moves toward an Internet of Things,[101] it is conceivable that our televisions, refrigerators, and cars might be used to reveal aspects of our personalities that will help marketers predict our future behavior.

To be sure, sometimes Big Data has predictive power because it teases out regularities that have little to do with personality. For example, Target Corporation's data miners identified a pattern whereby their female customers who suddenly started purchasing multivitamins and lotion were buying cribs and newborn diapers six months later.[102] Through analytics, Target realized that multivitamin and lotion purchases were an indicator that the woman was pregnant, which she might not otherwise reveal to Target. The company used this information to its advantage and focused its efforts on keeping a new mother's business despite her life-changing event of pregnancy, which marketing research has shown to disrupt buying behavior. If Target could make new moms into loyal customers, there was a greater chance that it could keep them as customers in the following years.[103]

B. *Big Data in the Law*

Big Data can be used to predict future behavior because the process of studying an individual's purchases, online searches, borrowing activity, and social network composition reveals aspects of that individual's personality and preferences. Of course, it is one thing for well-capitalized firms and political campaigns to employ analytics at a high level and another for lawyers or judges to duplicate the sophisticated processes. The institutional-competence concerns are legitimate, especially at the present time, when courts have developed no expertise in profiling or in Big Data generally. There are several possible avenues by which Big Data could help personalize legal default rules:

(1) Firms could use what they know about their customers to provide them with personalized default terms and prices in contracts that are determined at the time a contract is entered into and which any customer could see before she executes the contract.

(2) Federal governmental regulatory agencies like the Consumer Financial Protection Bureau could identify particular default contractual provisions that are well suited to particular types of consumers and require firms to offer the terms to customers with those profiles. These terms would also be specified at the time the contract is entered into and any customer (or firm) could see them before contract execution.

(3) In cases where contracts are ambiguous or silent, courts could determine ex post what terms the parties probably would have specified in

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101. *See* Scott R. Peppet, *Freedom of Contract in an Augmented Reality: The Case of Consumer Contracts*, 59 UCLA L. Rev. 676, 699 (2012) (defining the Internet of Things as "a connected web of 'smart' objects capable of generating and transmitting data on themselves").

102. Charles Duhigg, *Psst, You in Aisle 5*, N.Y. Times, Feb. 19, 2012, (Magazine), at MM30, *available at* http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html?_r=0.

103. *Id.*

light of similarly situated parties' choices and preferences. The legally relevant issue would be the parties' observable characteristics and traits at the time they entered into the contract (or, in the case of probate matters, at the decedent's death or the moment when the decedent lost decisional capacity), as well as the parties' past behavior. Courts would rely on expert testimony to discern the contents of these personalized rules. In most disputes involving incomplete contracts or ambiguous terms, the parties would settle in the shadow of the (personalized) law. That is, they would anticipate how a court would most likely resolve their dispute if it were fully litigated and settle around that expected outcome.

Due to concerns about institutional competence, we believe that the first and second approaches are the most feasible and appropriate, although we shall spend some time discussing the third approach as well.

We have already shown how Big Data and personalizing default rules could change the law of inheritance.[104] Let us now consider other important applications.

1.   Consumer Contracts

Consumer law is perhaps the most natural field in which to apply the personalized default-rules approach. As we have explained, firms have an increasingly enormous amount of data on consumers' preferences and characteristics, and they can use this data to tailor different default rules for their contracts. The parties can use this same data to settle disputes in the shadow of the law, and courts can use it for adjudicating unsettled disputes. Since consumers are generally aware of their characteristics and traits, they will find the personalized default rules more predictable than the impersonal default rules currently applied to their contracts. A consumer who does not know what default rules apply to her contract would be able to easily verify it before or after the transaction takes place, either through the merchant who could provide her with the content of those rules at the point of sale or through intermediaries who could generate such information at low cost.

Consider Example 1 (Place of delivery), which suggests that while a default rule for consumers who are not disabled could be "delivery at the seller's place of business," a "delivery at the buyer's residence" might be a better default rule for disabled consumers. There is little need for data to employ a personalized default-rule approach in this case, and we would not be surprised to see courts reaching the same result through interpretive techniques.

In some industries, a default rule of "delivery at the buyer's residence" could be an efficient minoritarian default rule that would facilitate personalized default rules. Thus, a store that sells medical equipment might have a

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104.   *See supra* text accompanying notes 1–5.

relatively high number—but still a minority—of consumers who are disabled. Some of the disabilities may be visually hidden, and the disabled consumers might prefer not to disclose their disabilities verbally, especially if other customers are nearby. A default rule of "delivery at the buyer's place" would encourage nondisabled consumers to ask for delivery at the seller's place, with a possible price discount.

2. Organ Donation

The United States faces a severe shortage of organs for transplantation. About eighteen Americans die every day because of a shortage of organs available for lifesaving transplants, and nearly 114,000 Americans were on organ or tissue transplantation waiting lists as of 2012.[105] In the United States, organ donors must opt in to organ donation, whereas in other nations people must opt out of donation, a design choice that has a very powerful effect on the prevalence of organ donation.[106]

We think the United States default rule on organ donations is almost certainly indefensible on welfarist grounds. Yet the rule persists. Perhaps personalization presents a superior alternative to the status quo's impersonal opt-in rule. Although the question has not been studied extensively, some of the available research demonstrates that certain personality traits correlate with organ donation. For example, one Iranian study found that highly agreeable individuals were more likely to agree to donate the organs of a brain-dead loved one.[107] A Turkish study found that conscientiousness and willingness to become an organ donor were significantly correlated, and the authors developed a personality model that could explain 19% of the respondents' variation in their intentions to become an organ donor.[108] By contrast, a larger-scale Dutch study found no significant correlations between any of the Big Five characteristics and people's motivation to donate their body to science.[109]

To address this disagreement in the literature, Matthew Kugler and Lior Strahilevitz ran a pilot survey on Mechanical Turk, using approximately 340 research subjects. They found no statistically significant relationships between any of the Big Five characteristics and one's status as an organ donor

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105. Benny Evangelista, *Online Organs*, S.F. Chron., May 2, 2012, at D1, *available at* http://www.sfchronicle.com/business/article/Facebook-hopes-to-expand-organ-donation-awareness-3525917.php.

106. *See* Sunstein, *supra* note 8, at 4; Zackary Hawley et al., *Increasing Organ Donation via Changes in the Default Choice or Allocation Rule* 18–19 (Ga. State Univ., Working Paper No. 2012-15, 2012), *available at* http://excen.gsu.edu/workingpapers/GSU_EXCEN_WP_2012-15.pdf.

107. M. Kalantari-Khandan et al., *Personality Characteristics and Mental Health of Organ Donor and Non-Donor Families*, 16 World Applied Sci. J. 1183, 1187 (2012).

108. Başar Demir & G. Tarcan Kumkale, *Individual Differences in Willingness to Become an Organ Donor: A Decision Tree Approach to Reasoned Action*, 55 Personality & Individual Differences 63, 65, 67 (2013).

109. Sophie Bolt et al., *Personality and Motivation for Body Donation*, 193 Annals of Anatomy 112, 114 (2011).

or support for organ donation generally.[110] Interestingly, however, when Kugler and Strahilevitz measured personality using an alternative metric—the Authoritarianism scale popularized by John Duckitt, Boris Bizumic, Stephen Krauss, and Edna Heled[111]—they found consistent, significant correlations between political–psychological orientations and status and attitudes toward organ donation. Those who scored highest on Authoritarianism–Traditionalist scales were significantly less likely to be organ donors than those who scored lowest on those scales.[112] Self-described social conservatives were also significantly less likely than self-described social liberals to be organ donors and to support organ donation more generally. By itself, social conservatism explained 9% of the variation in individuals' propensity to be organ donors. Nine percent is a rather meaningful number by social science standards, although it likely does not represent a difference of sufficient power to warrant different defaults on a question like organ donation. But if a multifactor approach was capable of explaining organ-donation preferences more accurately, then personalization of default rules based on Authoritarianism scores and social conservatism might be appropriate.

The same correlations that proved powerful in predicting whether an individual was or intended to become an organ donor also predicted whether an individual was likely to support making presumed organ donation the default legal rule. Here, too, people scoring high on Authoritarianism–Traditionalist scales and those who self-identified as social conservatives were significantly less likely to support a default rule of presumed consent. Unsurprisingly, organ donors and those intending to become donors were far more likely to support a presumed consent default than nondonors. In the Kugler and Strahilevitz sample, 36% of donors and intended donors supported a presumed consent default but only 8% of nondonors supported such a default rule. (Big Five scores did not correlate with attitudes about the content of organ donation default rules in their sample.) The American rule requiring organ donors to opt in is popular domestically, notwithstanding its apparent responsibility for killing thousands of Americans annually.

We are not certain that a sufficiently predictive model of organ donation based on personality, political orientation, and other aspects of individuals' identities can be developed to enable accurate personalization of defaults. If

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110.   Agreeableness correlated most strongly with organ-donor status and organ-donation support, although this correlation was not significant. Openness and neuroticism also had the anticipated relationships with organ-donation status and attitudes, although they were also not significant.

111.   John Duckitt et al., *A Tripartite Approach to Right-Wing Authoritarianism: The Authoritarianism-Conservatism-Traditionalism Model*, 31 Pol. Psychol. 685 (2010).

112.   The Authoritarianism–Traditionalism scale "expresses the value and motivational goal of maintaining traditional lifestyles, norms, and morality, and resisting 'modern' liberal, secular, open, lifestyles, norms, and morality." *Id.* at 691. To measure Authoritarianism–Traditionalism, the scholars asked survey respondents, for example, about their belief in "old fashioned values," their beliefs in strict adherence to "God's laws about abortion, pornography, and marriage," and whether young peoples' experimentation with drugs, alcohol, and sex threatens societal success. *Id.* at 711.

such personalization is possible, then it might permit policymakers to move past the tired dichotomy of opt-in versus opt-out. Suppose that the Kugler and Strahilevitz pilot study is widely replicated in the United States and turns out to understate the magnitude of its primary effects. Then the law might provide that only very socially liberal people who score low on Authoritarianism–Traditionalism scales will be presumed to be organ donors by default, and the rest will be deemed nondonors. Big Data sources might clearly identify the orientation of a motorcycle victim brought into an emergency room so that the default rule could be determined. This default would then become the starting point for an examination of whether a fatally injured patient expressed a view on organ donation that deviates from the default. Employing such a personalized default rule could engender increased donation rates relative to the impersonal opt-in rule of the status quo, and it could also reflect individual preferences better than an impersonal opt-out rule. Such an approach could represent a workable compromise in organ transplantation law.

3. Medical Malpractice

The personalized default approach could also work in the medical malpractice context. Suppose that a doctor has prescribed a drug that, when taken for a prolonged period of time, causes a very unfortunate side effect in a very small number of patients (one in every 500,000) who take the drug for prolonged periods. The drug is most effective when taken for a long time, but it is still somewhat effective when taken for just a week or two. The doctor fails to warn the patient about this particular side effect, and the patient suffers the effect and then sues the doctor for malpractice, alleging a failure to obtain informed consent. A key focus of the legal inquiry will be causation: Would the patient have consented to undergo the treatment even if she had been warned about the side effect? As long as the doctor has no concrete information about the particular patient's wishes or expectations regarding disclosure, presently the law treats this inquiry as an objective one: What would a reasonably prudent patient have done?[113]

Our approach contemplates a rule whereby a physician can tailor her disclosure of risks to particular patients—even though she has no concrete information about the particular patient's wishes or expectations regarding disclosure. The physician will then be judged based on whether her disclosure was appropriate for a particular patient type (rather than for the hypothetical reasonably prudent patient).

Big Data firms like the Fair Isaac Corporation ("FICO") have already gotten into the business of using data mining to predict patients' future behavior, as evidenced by the firm's having recently launched its FICO Adherence Scoring. FICO Adherence Scores use information from a patient's credit report to predict the likelihood that a patient will regularly take his

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113.   *See, e.g.*, Canesi *ex rel.* Canesi v. Wilson, 730 A.2d 805, 812 (N.J. 1999).

prescription medication and otherwise adhere to medical advice.[114] Suppose a doctor consulted a patient's FICO Adherence Score, and FICO predicted that there was only a 5% chance that the patient would take the medication for long enough to render the side effect a possibility. The doctor does some quick math and determines that the risk that this particular patient would suffer the side effect is 1 in 10 million. Given that any warning may cause psychosomatic symptoms or raise the likelihood of cognitive errors by the patient, the doctor elects not to warn the patient.[115] In our analysis, a default rule of nondisclosure would be appropriate *for this particular patient.*

At the same time, if the same doctor were treating a *different* patient, one for whom FICO predicted a 95% chance that the patient would continue taking the medication for long enough to trigger a possible side effect, then the court's ruling could well come out differently. The odds of the side effect occurring for this patient are approximately 1 in 526,000,[116] and these odds, while remote, might still be sufficient to warrant disclosure to the patient. Personalizing the default rule permits the physician to practice personalized medicine to a much greater degree—a development that could substantially advance the efficiency of health-care delivery.[117]

Pushing the point further, we might imagine ways in which other forms of Big Data could affect the informed-consent calculus. One of the other functions of credit scoring is to assess an individual's tolerance for risk. Risk is apparently correlated across a number of life activities, such that individuals who drive in a risky manner make risky personal financial decisions as well.[118] Suppose that a plaintiff's consumer behavior profile reveals that she is an extremely cautious person. In this case, the law might impose heightened disclosure requirements on the physician. If the patient's profile reveals that she is a devil-may-care consumer, then giving short shrift to disclosures of low risks may be appropriate for the physician in a world where disclosure

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114.   Jeremy M. Simon, *New Medical FICO Score Sparks Controversy, Questions*, Credit-Cards.com (July 28, 2011), http://www.creditcards.com/credit-card-news/fico-score-medica-tion-adherence-1270.php.

115.   *See generally* Gil Siegal et al., *Personalized Disclosure by Information-on-Demand: Attending to Patients' Needs in the Informed Consent Process*, 40 J.L. Med. & Ethics 359, 360 (2012) (discussing the issues doctors consider when determining how much information to provide to patients in attempting to gain informed consent).

116.   With a 95% chance that the patient would consume the drug for a long enough time to render the side effect a possibility, the risk of the side effect is 19 times higher than with a 5% chance. We assume for purposes of simplicity that once the patient uses the drug for a sufficient amount of time, the side effect's likelihood does not increase with the time of consumption. Relaxing this assumption would enhance the risk differentials between the two hypothetical patients.

117.   *See* Gary E. Marchant, *Foreword: Law and the New Era of Personalized Medicine*, 48 Jurimetrics J. 131 (2008) (introducing a symposium on the law of personalized medicine).

118.   Edward R. Morrison & Arpit Gupta, Health Shocks and Household Financial Fragility: Evidence from Automobile Crashes and Consumer Bankruptcy Filings 3 (Feb. 13, 2013) (unpublished draft), *available at* http://economics.uchicago.edu/workshops/Morrison%20Ed-ward%20Health%20Shocks.pdf.

may be both time consuming and potentially harmful to the patient's emotional well-being. Such an approach to adjudicating medical malpractice cases, where the patient's profile at the time the medication was prescribed is part of the factual record before the court, may help steer adjudicators away from the dangers of hindsight bias. In these cases, the judge or jury knows that a bad outcome has occurred and is tempted to think that a reasonable patient would have wanted to know about the possibility of such an outcome, even though the ex ante risk of this outcome was extremely remote.[119]

The (hopefully rare) patient whom FICO or other providers of analytics misunderstand would have the chance to opt out. Under a new version of informed consent, the physician may tell a patient, "This is the sort of person our analytics contractor thinks you are. If we have misunderstood you, please tell us now, because it will affect the facts I disclose to you and the circumstances that will prompt me to ask for further consent or clarification."[120] We will say more about this sort of personalized disclosure in Part IV.

In other contexts, personalized informed-consent default rules could further the interests of third parties. Consider vaccination: children are vaccinated from diseases, but it is often in a particular child's best interest, strictly speaking, not to take the vaccine—which has possible side effects—because the rest of the population is vaccinated, thereby reducing the chances the child will come into contact with the disease. To avoid such free riding, a mandatory law could force vaccination. A softer approach would set an impersonal default rule according to which doctors could say nothing about side effects unless asked; they would proceed with the vaccination

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119.   *See* Jeffrey J. Rachlinski, *A Positive Psychological Theory of Judging in Hindsight*, 65 U. Chi. L. Rev. 571, 615–16 (1998) (discussing medical malpractice litigation and hindsight bias).

120.   For more on the benefits and perils of such discussion, see *infra* text accompanying notes 225–230.

In two interesting papers that appeared just as the final version of this Article was going to press, Annette Rid and David Wendler advocate the use of a "Patient Preference Predictor" that would predict "incapacitated patients' treatment preferences based on their individual characteristics and information on how these characteristics influence individuals' preferences regarding treatment during periods of decisional incapacity." Annette Rid & David Wendler, *Treatment Decision Making for Incapacitated Patients: Is Development and Use of a Patient Preference Predictor Feasible?*, 39 J. Med. & Phil. 130, 131 (2014) [hereinafter Rid & Wendler, *Feasibility*]; *see also* Annette Rid & David Wendler, *Use of a Patient Preference Predictor to Help Make Medical Decisions for Incapacitated Patients*, 39 J. Med. & Phil. 104 (2014) [hereinafter Rid & Wendler, *Predictor*]. Their proposed approach relies on surveys, Rid & Wendler, *Predictor*, *supra*, at 112, rather than analysis of observed behavior and guinea-pig matching. *See* discussion *infra* text accompanying note 150. Rid and Wendler advocate the use of Patient Preference Predictors to inform treatment decisions that a nondecisional patient's health-care surrogate must make, in a manner that might alleviate conflict among relatives and reduce the surrogate's anxiety about whether those decisions conform to what the patient would have wanted were she still able to express a preference. Rid & Wendler, *Predictor*, *supra*, at 113, 117. Alternatively, they suggest that the results of the predictor could be used to generate default rules in this particular health-care context. Rid & Wendler, *Feasibility*, *supra*, at 147. For a legal scholar's response to Rid & Wendler's proposal, see Rebecca Dresser, *Law, Ethics, and the Patient Preference Predictor*, 39 J. Med. & Phil. 178 (2014).

unless told otherwise. An even better approach—in a world where, say, 80–90% vaccination suffices to create herd immunity, and 10% of the population is likely to suffer side effects from vaccination—would be to personalize the disclosure default. For example, the "no information unless the patient asked" default rule would not apply to patients whose attributes correlate most closely with those of patients who have suffered side effects in Food and Drug Administration trials.

Resources like FICO Adherence Scores are not the only tool that could be used to personalize the law of informed consent and medical malpractice. Some research suggests that Big Five neuroticism/emotional stability scores can help predict hypochondria.[121] In light of concerns about a hypochondriac's psychosomatic response to being told about a given side effect, physicians might appropriately elect to inform an emotionally stable patient about a very unlikely side effect while offering information about the same side effect to a highly neurotic patient only if asked. In this sense, using Big Data tools to assess personality, which can in turn help a physician personalize disclosures to a patient, could have significant therapeutic value.

4.   Landlord–Tenant Law

We believe that personalized default rules are appropriate in adjudicating disputes in property law as well. Suppose a landlord and tenant are involved in litigation. The tenant lives alone and has rented a two-bedroom apartment for $600 a month in a neighborhood where the average similarly sized apartment rents for twice that amount. The written lease specifies the rent, the term, and various other factors, but it says nothing about the quality of the apartment. Now suppose that a few months after the tenant moves in, plaster begins falling from the ceiling in the second bedroom, making it an unsafe space for sleeping, although the tenant continues to use the bedroom for storing personal belongings. Has the condition in the second bedroom amounted to a breach of the lease, such that if the ceiling is not repaired upon request the tenant can move out and stop paying rent? In most American jurisdictions, the answer to this question is yes. The condition of the ceiling constitutes a breach of the implied warranty of habitability, which is read into every landlord–tenant contract.[122] In some jurisdictions, however, the implied warranty of habitability functions as a default provision that the parties can waive via explicit contract terms.[123]

American law has largely stuck with a one-size-fits-all approach to the implied warranty of habitability, although the limited exceptions are important for our purposes. As a general matter, the implied warranty of habitability will be read into any residential lease. But some jurisdictions hold that there will be no such warranty when the tenant rents a single-family home

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121.   Eamonn Ferguson, *Personality as a Predictor of Hypochondriacal Concerns: Results from Two Longitudinal Studies*, 56 J. Psychosomatic Res. 307, 311 (2004).

122.   *See, e.g.*, Hilder v. St. Peter, 478 A.2d 202, 207 (Vt. 1984).

123.   *See, e.g.*, P.H. Inv. v. Oliver, 818 P.2d 1018, 1021–22 (Utah 1991).

(as opposed to a unit in a multiunit building),[124] and other jurisdictions recognize nothing akin to an implied warranty of habitability when nonresidential properties are leased.[125] This granularity of the rules is based on common law courts' suppositions that particular variables governing property ought to affect the tenant's substantive legal rights.[126]

Our approach to personalized default rules posits that the characteristics of the tenant (and landlord) may be relevant to determining the appropriate missing term to impose on the contract. This is particularly true when the landlord has access to information relating to the tenant's past behavior, characteristics, and traits, or to other data indicating the suitable default rules for the tenant. Compared with tenants with similar incomes, is this tenant routinely willing to sacrifice quality in return for cost savings? If so, the court ought to view the lease as lacking an implied warranty of habitability. Is the tenant someone who stays in nice hotels far more frequently than most travelers with similar incomes, pays for weekly maid service, and otherwise indicates a propensity for paying for comfort and pleasing aesthetics? If so, the court ought to view the lease as containing an implied warranty of habitability. Does the tenant score high on personality metrics measuring neuroticism, such that the prospect of problems with the ceiling will keep her awake at night? Or is she a very emotionally stable person who may be annoyed but will not be made anxious by her substandard ceiling?[127]

We are not suggesting that these intuitive correlations among purchasing history, personality, and expectations for an apartment are airtight. We are articulating falsifiable hypotheses that ought to be tested empirically. But since at least the mid-1990s, consumer profilers have been able to analyze a broad swath of personal information relating to transactions and to use algorithms to identify "value oriented" or "Rodeo Drive Chic" consumers for marketing purposes.[128]

5. Labor Law

American labor law is not often thought of in terms of default rules, but defaults are very important in this field. More precisely, the default provision under the National Labor Relations Act is that workers are not unionized. If a group of workers mount a unionization drive and a majority of the workers (or, in some cases, a majority of a subset of the nonmanagement workers) within a workplace vote to unionize, then a union will be certified, and it will be authorized to bargain collectively on behalf of all the workers

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124. *See, e.g.*, Zimmerman v. Moore, 441 N.E.2d 690, 696 (Ind. Ct. App. 1982).

125. *See, e.g.*, K & S Enters. v. Kennedy Office Supply Co., 520 S.E.2d. 122, 126 (N.C. Ct. App. 1999).

126. Note the similarities to the U.C.C.'s treatment of unique and nonunique goods. *See supra* notes 35–36 and accompanying text.

127. A counterargument is that an implied warranty of habitability should apply to any tenant unless he *explicitly* waves it. We develop this point further *infra* in text accompanying notes 174–175.

128. *See* Dwyer v. Am. Express Co., 652 N.E.2d 1351, 1353 (Ill. App. Ct. 1995).

as a whole.[129] Union certification efforts can be cumbersome, expensive, and contentious. At the same time, it seems plausible that American law's chosen default rule is an appropriate one on majoritarian grounds—most American workers are nonunionized and have been for quite some time.[130]

Psychological studies have shown that personality characteristics correlate strongly with membership in a voluntary union. In particular, the Big Five traits of extraversion and neuroticism both predict union membership, and the interaction of these two traits predicts union membership very strongly.[131] Big Five personality characteristics also predict which industries individuals are likely to be drawn to and which individuals are most likely to thrive and retain their jobs in particular industries. For example, nurses who report high levels of neuroticism are much more likely to experience emotional exhaustion and burnout, which may cause them to leave nursing, whereas nurses with high levels of extraversion are likely to avoid burnout.[132] And while politicians score very high on extraversion and openness, bureaucrats do not.[133] Managers and sales representatives show high levels of extraversion,[134] and the unemployed commonly evince high levels of neuroticism.[135]

This kind of data suggests a radical possibility, which is that certain workplaces or industries, especially those containing high numbers of very extraverted and neurotic individuals, might be deemed unionized by default.[136] Given the underrepresentation of highly neurotic individuals in the workforce, the nonunionized default plausibly makes sense for most workplaces.

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129.   *What We Do: Conduct Elections*, Nat'l Lab. Rel. Board, http://www.nlrb.gov/what-we-do/conduct-elections (last visited Nov. 17, 2013).

130.   *Union Members Summary*, Bureau of Lab. Stat., (Jan. 24, 2013, 10:00 AM), http://www.bls.gov/news.release/union2.nr0.htm. An important caveat is in order. We do not know about workers' preferences regarding unionization in an environment where there are no transaction costs for forming a union. Moreover, some workers' decisions not to be part of a union may result from coercion or collective action problems. *See* Jeffrey M. Hirsch, *Communication Breakdown: Reviving the Role of Discourse in the Regulation of Employee Collective Action*, 44 U.C. Davis L. Rev. 1091, 1097, 1126–27 (2011).

131.   K.R. Parkes & T.D.B. Razavi, *Personality and Attitudinal Variables as Predictors of Voluntary Union Membership*, 37 Personality & Individual Differences 333, 342–43 (2004).

132.   *See* Kelly L. Zellars et al., *Burnout in Health Care: The Role of the Five Factors of Personality*, 30 J. Applied Soc. Psychol. 1570, 1588–89 (2000).

133.   Michael Ashton et al., *Personality Traits of Municipal Politicians and Staff*, 50 Can. Pub. Admin. 273, 285 (2007).

134.   Barrick & Mount, *supra* note 84, at 19.

135.   Vijaya Murali & Femi Oyebode, *Poverty, Social Inequality and Mental Health*, 10 Advances in Psychiatric Treatment 216 (2004).

136.   We ignore the (realistic) problem of multiple unions competing to represent the same workforce. *See generally* Agnes Akkerman, *Union Competition and Strikes: The Need for Analysis at the Sector Level*, 61 Indus. & Lab. Rel. Rev. 445, 446–49 (2008) (reviewing comparative data on competition among unions); Ann C. Hodges, *Southern Solutions for Wisconsin Woes*, 43 U. Tol. L. Rev. 633, 647 (2012) (discussing informal noncompetition arrangements among unions in Virginia).

At this point, we want to identify this kind of workplace profiling to determine the default rule as a theoretical possibility rather than as something we are advocating. Correlation and causation are distinct, and the factors that drive union membership continue to be debated.[137] For example, it is plausible that extraversion and neuroticism explain the success of unionization campaigns rather than workers' underlying preference for union membership. It is even conceivable that correlation runs in the opposite direction and that participation in a union makes workers more extraverted and neurotic. We would need to get a fuller sense of these causal variables before offering prescriptions for labor law. That said, depending on the results of future research, a prounionization default rule could be appropriate in some contexts.

C.   *Big Data Guinea Pigs*

Countries with enormous populations ought to take advantage of economies of scale. In this case, that would mean forgoing the careful monitoring of all their citizens' choices and perhaps sidestepping some of the problems from inefficient social norms in the process. We therefore propose that American law ask 1 million guinea-pig residents to make active choices about their preferences, which the law would then data mine to identify the ways in which the other 314 million individual Americans are similar to the 1 million guinea pigs.[138] The law would provide modest compensation to the guinea pigs for the costs they incurred in the process. The guinea pigs' active choices would then become the personalized default choices for the people most similar to them across a variety of observable metrics. These surveys could be conducted through a governmental agency, like the Census Bureau or Consumer Financial Protection Bureau, or through an industry consortium.

A great deal of contract law scholarship concerns the extent to which consumers are rushed or inattentive and pay little attention to contract terms as a result.[139] Yet, if one in every 314 people is a compensated contract-law guinea pig,[140] then the law might reasonably devote substantial resources to making sure that these guinea pigs are very well informed and have adequate time to consider the contractual options and associated trade-offs. The guinea pigs would spend time reading the fine print so others do not have to. Once an entity—presumably a governmental agency—has assembled a large dataset to track the choices of these guinea pigs, the entity

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137.   An introductory analysis of these questions is offered in Nicola-Maria Riley, *Determinants of Union Membership: A Review*, 11 Labour 265 (1997).

138.   *See infra* Section II.C.

139.   *See, e.g.*, Florencia Marotta-Wurgler, *Will Increased Disclosure Help? Evaluating the Recommendations of the ALI's "Principles of the Law of Software Contracts"*, 78 U. Chi. L. Rev. 165, 182 (2011) (pointing out that almost no consumer making transactions through the internet read the contract before accepting it).

140.   The guinea pigs' attributes and decisions would be closely scrutinized so that other people would not need to be subjected to high decision costs and such exacting scrutiny.

can identify behavioral patterns and facilitate efforts by firms to give each consumer a set of default contractual terms that mimic those chosen by the guinea pigs with the personalities and attributes most similar to hers. We envision a "clustering" approach for identifying coherent groups of people to whom particular personalized default rules will apply.[141] Only the choices made by the guinea pigs prior to the time the contract at issue was executed would matter.

In a recent article, Ayres and Schwartz propose that firms be required to survey their customers about whether particular terms in a contract are consistent with their expectations.[142] Terms that surprised many consumers or that had surprising and very bad consequences for a smaller number of consumers would need to be set apart in a special box designed to prompt consumers to pay more attention to such terms.[143] A consumer-voting mechanism could ensure that the most surprising or most disadvantageous terms appear most prominently in the special box.[144] Ayres and Schwartz's proposal somewhat resembles our approaches to defaults and disclosure.[145] But whereas Ayres and Schwartz propose an impersonal approach to determining which contract terms are problematic, our approach is personalized. It recognizes that different terms will be problematic to different types of people, so the "boxes" or defaults that different sorts of people are shown should differ systematically.

Our "sampling" strategy mirrors the sorts of extrapolations that demographers and survey researchers routinely use in their work.[146] And the private sector already uses such strategies for predictive purposes. For example, Netflix's Cinematch algorithm for movie ratings (a) analyzes the one- to five-star ratings provided by its users after they have seen a movie; (b) matches each user's ratings with the ratings of other users in the Netflix database; and (c) uses these similarity scores to predict how much users will like particular movies. Users can then employ these predictions in deciding which films to rent or stream.[147] The more films a user rates, the better the

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141.   Obviously, the devil is in the details with respect to how these clusters will be created and what happens to consumers whose profiles place them at the borderline between different clusters. For further discussion, see Ankit Agrawal et al., *High Performance Big Data Clustering*, *in* Cloud Computing and Big Data 192 (Charlie Catlett et al. eds., 2013).

142.   Ian Ayres & Alan Schwartz, *The No-Reading Problem in Consumer Contract Law*, 66 Stan. L. Rev. 545 (2014).

143.   *Id.* at 583.

144.   *Id.* at 584.

145.   *See infra* Part IV.

146.   The closest analogue for the guinea pigs proposal in existing legal scholarship would be the sort of legal experimentation proposed in Michael Abramowicz et al., *Randomizing Law*, 159 U. Pa. L. Rev. 929 (2011) (proposing randomized trials to test the efficacy of laws and regulations). For another recent article advocating greater regulatory experimentalism, especially continuous learning and updating, see Charles F. Sabel & William H. Simon, *Minimalism and Experimentalism in the Administrative State*, 100 Geo. L.J. 53 (2011).

147.   *See* Clive Thompson, *If You Liked This, You're Sure to Love That*, N.Y. Times, Nov. 23, 2008, (Magazine), at MM74, *available at* http://www.nytimes.com/2008/11/23/magazine/23 Netflix-t.html?pagewanted=all&_r=0.

algorithm can personalize the user's movie recommendations and the recommendations of similar Netflix customers.

Of course, rating each movie on Netflix entails an active choice. Many Netflix users do not bother to evaluate movies they have seen, perhaps because it is time consuming.[148] And many Netflix users similarly do not use the "taste preferences" features, which permit users to specify how often they watch movies that can be characterized as "absurd," "bawdy," "cerebral," "dark," etc.[149] One of the potential benefits of personalized default rules in a world of Big Data is that much of the data used to generate similarity scores and personalized defaults will be generated automatically, without requiring the user to do anything. It is almost tantamount to Netflix monitoring how many times a viewer laughed during a comedy, cried during a tragedy, or gasped during a horror flick.

A more modest alternative to using guinea pigs would be to generate information necessary for personalizing default rules by asking individuals about their general preferences, characteristics, and traits, as well as about their past behaviors, and using this information to tailor default rules *for them*. An agency might distribute questionnaires to consumers, explaining that the answers will be used for personalizing default rules in their interactions with merchants. We predict that many consumers will answer the questionnaires, which should not be too intrusive, with the understanding that their answers would facilitate their receiving deals better adapted to their true preferences. The gist of the approach is to use information culled from a survey to modify defaults that a consumer will encounter. This blanket approach to personalizing default rules seems far more efficient than selective modifications of contractual boilerplate on a transaction-by-transaction basis. We propose that individuals should be able to see the "profile" constructed for them and change this profile if it does not fit their true preferences.[150]

In any event, in modern, high-stakes transactions, it is becoming increasingly common for sellers to have information about the consumers they are dealing with, which enables them to decide on pricing and service quality, pinpoint potentially fraudulent transactions, and evaluate the effectiveness of their marketing strategies.[151] As the information age proceeds, it will be reasonable to assume that sellers "know their customers" and either already are or can easily become familiar with the personalized default rules that correspond to particular customers.

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148.   *See id.* Another reason users might not rate movies is that they do not think their opinion of a particular film is any of Netflix's business (or the business of anyone with whom Netflix might share data). Seen from this perspective, seamless, automatic sharing is more troubling than the sharing via active choices that occurs with Netflix's system.

149.   *Taste Preferences*, Netflix, http://dvd.netflix.com/TastePreferences (last visited Jan. 25, 2014).

150.   Securing individuals' active participation in constructing their profiles could also occur under our guinea-pigs scheme: each individual would be able to identify her profile and request changes to it.

151.   *See, e.g.*, Duhigg, *supra* note 102.

Consumers are less likely to have this sort of information about individual firms' propensities, although in the case of large national firms or local firms with extensive Yelp profiles, the information asymmetries may be less pronounced. Imposing on consumers a burden to "know their sellers" is less justifiable, particularly when they are dealing with small-scale sellers in non-repeat-play environments.[152]

III.   Possible Objections and Limitations

Part II articulated a rather bold vision of personalized default rules. In this Part, we want to confront some potential objections to our proposal while conceding that some of these objections warrant limiting the appropriate scope for personalized default rules.

A.   *Cross Subsidies*

An obvious objection to our proposal relates to the equities and inefficiencies of cross subsidization. In our analysis, two consumers might buy the same product for the same price but receive a different set of contractual rights as part of the transaction. That might be unjust and inefficient.

Consider the following example:

> *Example 3. Right to return.* Dana is conservative, very careful in her behavior in all fields of life. She is a cautious consumer: before she buys anything, she consults *Consumer Reports* and asks for her friends' advice. In the past, she has never returned a product she bought, unless it was defective. Jim is a risk taker who is quite impulsive and excitable. He makes decisions fast, without consulting anyone. In the past, he returned products he bought several times just because he realized he should not have bought them in the first place. Both Dana and Jim have separately bought a new flat-screen television at the same store. After a day of using the new television, they each realized that this purchase was a mistake. They want to return the product and get their money back. Should they be treated in the same manner?

Under current law, the answer is yes. Whether the default rule is a "right to return"[153] or "no right to return," it would apply equally to Dana and Jim. If, however, personalized default rules are permitted and feasible, Jim should arguably enjoy the right to return but Dana should not because Jim needs it more. Since the buyer's exercise of such a right is costly for the seller and since both Dana and Jim paid the same price, the result would be that careful Dana subsidizes hasty Jim—a result that is both unjust and inefficient.

Upon closer scrutiny, a personalized default rule in Example 3 would be different and is preferable to an impersonalized default rule, especially if the

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152.   For further thoughts on this point, see *infra* Section III.C.

153.   In New York, unless the retailer opts out by displaying a "return and refund policy," the default rule provides a right to return for cash up to thirty days after the purchase. *See* N.Y. Gen. Bus. Law § 218-a (McKinney 2012); *see also* Cal. Civ. Code § 1723 (West 2009) (applying the same default as in New York).

impersonalized rule contains a right to return.[154] With an impersonalized default rule, both Dana and Jim pay the same price and get the same default rule of a right to return. But since Jim uses this right more often than Dana, Dana subsidizes Jim through the contract price.

With a personalized default rule, the cross subsidization either disappears or at least diminishes. It disappears if both the default rule and the price are personalized. In this scenario, if either Dana or Jim gets the right to return, he or she pays a price reflecting the expected cost of each of them exercising the right, resulting in no cross subsidization. But even if prices are not adapted to the personalized default rule, the cross subsidization would diminish. This would occur because the efficient personalized default rule for Jim is probably no right to return, and the efficient counterpart rule for Dana is probably a right to return. Although Jim ostensibly needs the right to return more than Dana because he exercise it more often, he uses the right more frequently precisely because Dana subsidizes him. With such personalized default rules, there would still be some cross subsidization—now Jim subsidizes Dana—but the level of such subsidization would be lower than it would under an impersonal default rule where both Dana and Jim have the right to return.

B.   *Strategic Behavior*

Crude personalized default rules tied to an individual's immutable characteristics, such as sex or age, alleviate significant concerns about strategic behavior. Under our proposal for granular personalized default rules, however, the products and services that an individual buys, the keywords he uses in his searches, the company he keeps, and various other aspects of his behavior can influence the terms under which he will purchase goods and services. When an individual consumer changes his behavior, he is simultaneously changing the identities of the guinea pigs with whom he will be compared. In effect, the consumer trades default rules: he replaces the rules selected by the guinea pigs who used to behave like him for the rules selected by the guinea pigs who behave like the "new him." Given this possibility, there is a danger that individual consumers will engage in strategic behavior to ensure that they are compared to the guinea pigs who have selected the most generous default terms.

To take a salient example of this problem, a Canadian credit-card issuer determined during the last decade that consumers who purchase carbon monoxide detectors or felt pads to be placed at the bottom of chair and furniture legs are exceptionally low credit risks.[155] Evidently, people concerned about the dangers of carbon monoxide or intent on preventing

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154.   If the impersonal default rule is "no right to return," there is no cross subsidization, although not every consumer gets *her* preferred default rule, a problem that our personalized default-rule regime aims to resolve.

155.   Charles Duhigg, *What Does Your Credit-Card Company Know About You?*, N.Y. Times, May 17, 2009, (Magazine), at MM40, *available at* http://www.nytimes.com/2009/05/17/magazine/17credit-t.html?pagewanted=all.

scratches on hardwood floors are extremely careful, conscientious individuals with low discount rates; they are precisely the sort of people likely to repay loans on time.[156] Before it publicized this finding, the credit-card issuer could use its knowledge of felt pad and carbon monoxide–detector purchases to price risk. But as soon as the correlation became public, its value diminished substantially. After all, felt pads and carbon monoxide detectors are relatively inexpensive compared to home-mortgage loans. It would be in everyone's interests to stock up on these household products a few months before seeking to purchase a house, even if they had no intention of putting these items to their ordinary use. In this way, the strategic purchase of felt pads and carbon monoxide detectors would function as a smoke screen.[157]

Although the problem of strategic behavior is always an issue, we do not think it is particularly troublesome in this context. *First*, a great deal of predictive analytics is and will remain proprietary. Guessing which products function as felt pads will not be easy, and people who discover how to game the system will have little incentive to disclose publicly their success stories. *Second*, even when it becomes clear that certain types of behavior will be associated with more beneficial default terms in some contexts, employing smoke screens is costly. If people regularly purchase products they do not need, become Facebook friends with people they do not like, or develop hobbies they do not enjoy in order to enhance the quality of their personalized default profiles, they often will be making themselves worse off. Changing one's behavior is a costly signal; it is not cheap talk. Much of the time it will be easier just to specify a different contractual term when entering into a contract—or simply pay a higher price—rather than putting on an elaborate and costly performance to achieve the same result. *Third*, while maintaining a charade may be easy for a short period of time, it gets harder for the consumer (and easier for the seller to detect) with every passing day. Thus, in Example 3 (Right to return), if hasty Jim pretended to be careful and hence obtained a right to return, after he abuses this right several times, merchants would recognize his true character and treat him accordingly. *Fourth*, on many occasions, consumers will not really benefit from pretending to be what they are not: possessing a specific character could benefit a consumer in one context but harm him in another context, and in many instances, faking it could cause a consumer to be presented with various default rules that do not fit him personally.

While we think strategic behavior is a manageable problem associated with personalized default rules, expanding personalization beyond waivable defaults would magnify the problem. Personalized default rules could potentially become so ingrained that sellers essentially refuse to bargain around them. In other words, firms might be willing to offer consumers contracts with personalized terms but might view negotiating around the personalized

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156. *Id.*

157. Lior Jacob Strahilevitz, *Signaling Exhaustion and Perfect Exclusion*, 10 J. ON TELECOMM. & HIGH TECH. L. 321, 327 (2012).

terms as prohibitive because of the high transaction costs. Such a progression away from personalized default rules and toward unwaivable "personalized terms" strikes us as a sufficiently thorny topic to warrant an article of its own. But we suspect that society will not need to cross this bridge, at least not in the immediate future, in part because the strategic behavior problem would be substantially magnified in a world where most terms were nonnegotiable.

C.   *Abuse by Merchants*

Another potential objection to our proposal—mostly relevant to consumer law—is that merchants could abuse the availability of large amounts of data to the detriment of consumers. When one party to a contract knows a lot about the other party's preferences but not vice versa, the party with more knowledge may enjoy a substantial advantage over the other party and extract a larger share of the contractual surplus. This risk materializes once we assume that the market is not fully competitive and that consumers are not fully informed. To illustrate this point, suppose a merchant knows that a specific consumer is highly risk averse. The merchant may then overcharge this consumer for decreasing her risks. More generally, data about consumers' preferences could indicate their willingness to pay for a certain product or service, thereby facilitating price discrimination.

We concede that this objection has force, although it is important to understand the precise nature of this force and the countervailing considerations. Firms already gather enormous amounts of information about individuals and use this information to boost their bottom line. This trend has its own economic rationale, and our proposal would have at most a marginal effect on it. That said, when all consumers are offered the same terms, price discrimination is easy to identify. When all consumers are offered personalized terms, however, price discrimination becomes much harder to spot. That which is hard to detect is more difficult to oppose and therefore tougher to deter.

Of course, price discrimination has ambiguous welfare effects. It tends to raise output, enabling consumers who otherwise could not obtain a good or service to do so, as well as to maximize producer surplus. The availability of personalized default terms is also designed to provide consumers with deals that better reflect their personalities and thereby encourage more consumers to enter into transactions with firms.[158] Indeed, we might conceptualize personalizing contractual terms as enabling consumers to reclaim some of the firms' surplus. Determining the dynamic effects of these simultaneous changes in consumer welfare is extremely tricky. In any event, it would be unwise to reject personalization solely on price-discrimination grounds.

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158.   For a lengthier discussion, see Strahilevitz, *supra* note 68, at 2027–29.

D.   *Uncertainty*

According to a fourth objection, adopting a personalized default-rule regime would increase uncertainty, thereby making the law less effective in guiding people's behavior. Personal default rules may also increase the costs of adjudication.[159] Impersonal default rules, by contrast, avoid these drawbacks.

An approach to contract law that locks in the guinea pigs' choices before the contract's execution would ameliorate any uncertainty created by personalized default rules. Any subsequent shifts in the guinea pigs' choices would be irrelevant to the meaning of a contract. This is the primary approach we advocate here. Mechanically, a consumer would be entitled to ask at the point of sale what personalized terms her consumer profile generates for her, and the firm would respond with a disclosure of the terms. Because the entire process would be automated, producing this information for consumers would not slow down transactions. While the consumer's review of the default terms might delay the transaction, the same is true of existing, written contract terms.

To better understand the uncertainty objection to our personalized default-rule regime, reconsider Example 3 (Right to return). If there is a one-size-fits-all default rule—either a right to return or no right to return—contractual parties could clearly understand whether in a specific transaction they have such a right. Similarly, in Example 2 (Specific performance or damages), if the choice of remedy is not contingent on the buyers' characteristics and traits, both Steven and Sarah could know in advance that in the event of a breach, they are entitled to specific performance (or damages), regardless of the inferences that could be derived from their particular traits. With personalized default rules, there is more uncertainty: in the two examples above, contracting parties would find it harder to contemplate their substantive rights and remedies.[160]

The choice between personalized default rules and impersonal default rules only loosely tracks the choice between rules and standards, which commentators have thoroughly analyzed.[161] Most importantly, rules are more costly to create, but standards are more costly both for individuals to interpret when deciding how to behave and for adjudicators to apply in evaluating past behaviors.[162] At first glance, an impersonal default rule ostensibly

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159.   Ayres, *supra* note 9, at 13 (discussing the complexity costs of tailoring default rules).

160.   *Cf.* Geis, *supra* note 10, at 1124–29 (discussing transaction costs, and other costs, of tailoring default rules).

161.   *See, e.g.*, Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 Duke L.J. 557 (1992) (describing the tradeoff between the use of rules and standards in law generally); Duncan Kennedy, *Form and Substance in Private Law Adjudication*, 89 Harv. L. Rev. 1685 (1976) (introducing the distinction between rules and standards).

162.   Isaac Ehrlich & Richard A. Posner, *An Economic Analysis of Legal Rulemaking*, 3 J. Legal Stud. 257, 262–71 (1974) (comparing rules and standards on the complexity dimension); Kaplow, *supra* note 161 (comparing rules with standards in various dimensions).

resembles a rule while a personalized default rule seems to resemble a standard. Thus, in Examples 2 and 3, an impersonal default rule (such as "damages" or "right to return," respectively) is a rule while a personalized default rule is a standard.

The rules-versus-standards dichotomy is not identical to the impersonal-versus-personalized default-rules dichotomy. In particular, there could be impersonal default rules that are standards (e.g., a duty of good faith) and personalized default rules that are rules (e.g., different intestacy rules for men and women).[163] Therefore, the crucial questions with personalized default rules are how to balance uncertainty with accuracy, better reduce transaction costs, encourage desirable behaviors, and meet people's reasonable expectations.

Would a personalized default rule typically be more associated with uncertainty than would an impersonal default rule? Not necessarily. A consumer living in a world with impersonal default rules would need to invest resources in learning the content of the default rule (or bear the risks of failing to do so). A consumer living in a world with personalized default rules would need to invest resources in learning the content of whichever default rule applies to him, and he may also need to research other plausibly applicable default rules along the way. Critically, the consumer *already knows* a great deal about his preferences and characteristics, which are the factors driving the choice among multiple personalized default rules. Assuming that Big Data does what it is supposed to do—identify patterns of behavior among similarly situated people—then the consumer will be able to intuit the law's contents based on what he himself would want, which would be a good proxy for the choices of guinea pigs just like him. It is therefore conceivable that the average consumer can discern the contents of applicable personalized default rules at a lower cost than he can discern the contents of an impersonal default rule, and he may very well be able to do so without consulting a lawyer.[164]

A caveat is in order. In our model, the guinea pigs are given more time and resources to make decisions, and it is conceivable that this extra time will cause them to make decisions that differ from the snap judgments that they (and those like them) would have made. If this gap is large, the effect will be greater consumer uncertainty combined with greater consumer satisfaction with their default choices. At worst, this seems likely to be a wash. Over time, many consumers may stop worrying so much about uncertainty, in the same way that consumers quickly overcame their widespread initial reluctance to purchase products over the internet using credit cards.[165] For

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163. *See* Geis, *supra* note 10, at 1116–19 (distinguishing among simple rules, complex rules, simple standards, and complex standards).

164. Geis comes tantalizingly close to making this important point but instead goes in a more familiar direction, using the heterogeneity of actors to whom rules are tailored to discuss the transaction costs associated with rejecting a default rule. *See id.* at 1122–23.

165. Thompson S.H. Teo, *Attitudes Toward Online Shopping and the Internet*, 21 Behav. & Info. Tech. 259, 265 (2002) (noting that in 2002 consumer concerns about the security of

the consumers who remain mistrustful, our proposal for personalized disclosure in Part IV offers a novel strategy for ameliorating the uncertainty problem.

In contracts between two consumers, especially consumers involved in non-repeat-play interactions, the uncertainty will rise dramatically, which is why we are quite skeptical about using personalized default rules in those contexts. But in contracts between a consumer and a profit-maximizing firm or between consumers involved in repeat-play interactions, the cognitive load *faced directly by consumers* should be more manageable.[166] Contracting firms may face information asymmetries regarding consumer preferences, but reducing these asymmetries is one of the Big Data industry's chief objectives.

Matters would become more complicated if courts entered the business of personalizing default rules. If judges are not skilled at identifying litigants' characteristics and preferences, then adjudicators' cognitive loads will rise as a result of the shift from impersonal to personalized default rules. And as these cognitive loads rise, the risk of judicial error increases, which will engender uncertainty for the parties themselves, even if these parties have perfect information about their own preferences and characteristics. As this analysis shows, the heightened uncertainty created by personalized default rules is likely to emerge indirectly, as a "shadow of the law" effect.[167]

Notwithstanding these substantial concerns about personalization in the litigation context, there are plenty of other cases where personalized default rules promote accuracy without increasing uncertainty. For example, in our hypothetical transaction between a firm and a consumer, the firm knows the terms to which a particular consumer is entitled at the time of the purchase. The law could require the preservation of these terms, even if the consumer does not ask to see her personalized default terms. If a subsequent dispute arises, the court would have as much access to the personalized terms as it would to the written contract, which means the uncertainty associated with interpretation would be no greater than normal. Nor is the uncertainty concern serious with regard to our inheritance law example or other cases where the default rule is tailored according to a salient and easily observable characteristic like sex or age. Where a personalized rule is tailored to a defined social group (e.g., a default of no organ donation among Shintos), we can expect group members to learn the contents of the crude personalized default rule without having to investigate it.[168] This brings us to a closely related objection: case law fragmentation. We turn next to this topic.

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financial information used to make purchases over the internet remained a significant impediment to e-commerce).

166.   *See supra* text accompanying note 150.

167.   *See generally* Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 Yale L.J. 950 (1979) (discussing "shadow of the law" effects in the context of divorce).

168.   *See supra* text accompanying notes 57–60.

E. *Case Law Fragmentation*

Impersonal default rules minimize the fragmentation of the case law resolving contractual ambiguity. This is a key advantage. Personalized default rules, by contrast, would engender greater fragmentation in the legal precedents. Such fragmentation is a real drawback of judicial determination of personalized default rules, and this drawback may convince readers that personalization should be limited to ex ante contexts and that only firms and specialized agencies—but *not* courts—should use personalized default rules.

Presently, if a court interprets ambiguous contractual language, its interpretation will have precedential value and help clarify the law in future disputes arising out of contractual ambiguity. The precedential effect is most powerful in any future dispute arising between the same parties concerning the same ambiguity. In such a case, the earlier precedent has preclusive effect. Even here, though, the court may construe the same contractual language to mean different things if it identifies pertinent differences in the context of the contract negotiation.[169] But the interpretation of language will certainly play a significant role in mitigating subsequent judicial uncertainty about the language's meaning in future disputes.[170] Still, the precedent may help reduce uncertainty with respect to similarly situated parties and similar contractual ambiguities. To be sure, lawyers and judges will be able to distinguish precedents that are closely on point if they are sufficiently motivated to do so, but the greater the similarities in the contractual language at issue, the more difficult it will be to distinguish the precedents on contextual or other grounds.

With personalized default rules, it becomes considerably easier to distinguish a precedent that a judge disfavors. Even if the contractual language at issue in an earlier case is identical to the language at issue in the case before the court, a party would appropriately argue that the litigant in the earlier case and the litigant in the current case have sufficiently different personalities, attributes, and profiles to warrant divergent interpretations of the ambiguity. No two human beings are identical in every respect, and therefore the court will have to confront the question of whether litigant heterogeneity merits a different result in the face of linguistic and contextual homogeneity. This fragmentation of precedent seems likely to aggravate uncertainty about the law's content. Where personalized default rules make this problem particularly pronounced, they should be regarded more skeptically.

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169.   *See* Forbo-Giubiasco S.A. v. Congoleum Corp., 516 F. Supp. 1210, 1214 (S.D.N.Y. 1981) ("The fact that Congoleum used the identical language in the Giubiasco Related Company Clause as it had used six years earlier in the Krommenie Related Company Clause would suggest that the two provisions should be interpreted in the same manner only if the same negotiating context for both contracts existed. However, Congoleum has presented uncontradicted evidence . . . that the understanding between Congoleum and Giubiasco in 1971 was not the same as the understanding between Congoleum and Krommenie in 1965.").

170.   *See, e.g.*, United States *ex rel.* B's Co. v. Cleveland Elec. Co. of S.C., 373 F.2d 585, 588 (4th Cir. 1967).

The question is ultimately one of tradeoffs, and it is not clear whether the costs of indirect uncertainty and case law fragmentation exceed the benefits of giving a greater number of individuals default rules that more closely approximate their preferences than impersonal default rules (if one adopts the majoritarian default-rule theory). To the extent that readers are concerned about excessive fragmentation, they might support a scaled-back version of our proposal, whereby personalized default rules could only be employed to deal with contractual silence but not with contractual ambiguity. Under this modified approach, identical contractual language would usually mean identical things to different people, but the absence of a contractual provision would have different implications for different parties.

Courts have occasionally confronted this fragmentation issue before. In one prominent decision, the Fifth Circuit held that interpreting identical contractual language to mean different things in different contexts was justified, despite protests about the extent to which such results would destabilize existing contracts.[171] If such an approach to interpretation is occasionally permissible when courts are engaged in ex post, holistic analyses of contractual meaning, then it ought to be even more palatable if undertaken in a rigorous, data-driven, ex ante way, which is our aspiration in advocating personalized default rules.[172] We therefore conclude that uncertainty and precedent fragmentation are important but not necessarily decisive considerations in determining the desirability of personalized default rules.

F.   *Statistics, Stereotyping, and Valuable Default Rules*

Another possible objection to our proposal is similar to the one raised against profiling in law enforcement or, more generally, against using statistical data for determining rights and duties. Statistical data does not focus on the individual parties; instead, it purports to establish factual findings and allocate rights and duties by using generalizations about the group to which the individuals belong, e.g., their sex, age, race, religion, or other group.[173] Such a method may contradict many people's moral intuitions. Furthermore, using statistical data creates stereotypes by ascribing to people attributes they may not have.

It is beyond the scope of this Article to discuss the pros and cons of using statistical data for allocating rights and duties and for law enforcement. We note, however, that any default rule, impersonal or personalized,

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171.   Hall v. Fed. Energy Regulatory Comm'n, 691 F.2d 1184, 1194–95, 1195 n.19 (5th Cir. 1982).

172.   We note in passing that our analysis of personalization has implications for the law of class-action suits. Class certification is only appropriate under the Federal Rules of Civil Procedure if the "claims or defenses of the representative parties are typical of the claims or defenses of the class." Fed. R. Civ. P. 23(a)(3). As the consumers' differences become increasingly regularized and the law comes to depend more heavily on the characteristics of particular consumers, the proper scope of class-action litigation will be substantially diminished.

173.   *See* Alex Stein, Foundations of Evidence Law 206–07 (2005).

is statistical in nature because it assigns rights and duties to individuals according to the averaged preferences of an entire population or a subset of people. Personalized default rules are just a better proxy—based on more accurate statistics—for the preferences of the specific party.

Therefore, the objection to our proposal is not that it uses statistical data as such—this kind of data should be used regardless of the type of default rule—but instead that it creates undesirable stereotypes. Take the intestacy example. Suppose that we use different default rules for men and women: when there is no will, most of a mother's estate goes to the children while most of the father's estate goes to the children's spouses. Such default rules could create (or strengthen) a stereotype that mothers care more about their children than fathers do. We consider this objection in the next section.

A variation of the objection discussed in this section relates to a subset of default rules pertaining to values that are central to our life and are not "mere" preferences. (We hereinafter call this subset of default rules "a fundamental values default rule.") Here, the argument against a personalized default rule is that because of strong societal interests, only explicit waiver of the fundamental values default rule should count; this rule cannot be waived by statistics indicating that a particular person would have opted for waiver if he had been given the choice. To illustrate this point, let us return to our implied warranty of habitability example[174] and to the question of whether personalized default rules should be used to leave some tenants without such a warranty provided they have not opted out of the default rule. If the implied warranty of habitability is a fundamental values default rule, then it might be appropriate to apply it to everyone regardless of his characteristics, attributes, and traits, while still respecting explicit opt outs for autonomy reasons. Note that this attitude could be considered a compromise between the warranty of habitability as an immutable rule—whereby even an explicit opt out is invalid—and the warranty as a personalized rule.[175]

We acknowledge that there could be fundamental values default rules that render personalized rules undesirable because there is too much at stake for society for the contracting parties' preferences to be decisive. Perhaps individual preferences contribute to a collective action problem or the risk of error is asymmetric, such that society is more willing to tolerate the problem of people paying for a warranty they do not want than the problem of people being denied a warranty that they (unpredictably) badly need. Determining what counts as a fundamental value default rule will, of course, prove contentious as well, and different readers may wish to confront these questions through various frameworks. Put another way, reliance on personalized default rules is most appropriate in those settings where the law is most comfortable deferring to the preferences of the people bound by an

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174.   *See supra* Section II.B.4.

175.   *Cf.* Ian Ayres, *Regulating Opt-Out: An Economic Theory of Altering Rules*, 121 Yale L.J. 2032, 2084–09 (2012) (describing sticky default rules as quasimandatory rules and arguing that sometimes the law makes opting out of certain default rules hard, but not impossible, in order to enhance paternalism or prevent externalities).

arrangement. But domains where the law is uncomfortable with letting individual choices govern—whether based on paternalistic grounds, deontological grounds, or concerns about collective action or asymmetric risk—personalized default rules will work less well.

G.   *Subordination, Adaptive Preferences, and Personalization*

Sunstein's paper on default rules provides an arresting example of an American default rule that may be simultaneously antimajoritarian and constitutionally compelled. He draws on fascinating work by Liz Emens,[176] which notes that overwhelming majorities of American women change their surnames when they get married but trivial numbers of men do so.[177] An obvious potential implication of these data is that a personalized default rule is appropriate. Changing one's name is time consuming,[178] but most women will adopt their husband's name upon marriage, so the law could just presume that women adopt their husband's names while providing an opt out for women who wish to retain their names or hyphenate their last names. Men's default would be no name change, again with an option to override this default upon request.

Sunstein contemplates the possibility of using a personalized majoritarian default for women's marital name changes but then rejects the idea, noting that "a default rule of this kind would be discriminatory, and it would almost certainly be found unconstitutional."[179] While Emens does not deem unconstitutional a waivable default rule presuming women wanted to change their names, she does argue that compulsory name changes for women would be unconstitutional,[180] and she makes a persuasive feminist case that state rules increasing the likelihood that women will adopt their husbands' surnames are normatively undesirable.[181] We will explore the descriptive constitutional claim shortly, but let us first address the normative issue.

We are sympathetic to Emens's concerns about pressuring women to change their names in light of the sexist history of name-changing conventions. We also share her concern that adaptive preferences may be causing women to change their names.[182] These strike us as good reasons for the law

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176.   Elizabeth F. Emens, *Changing Name Changing: Framing Rules and the Future of Marital Names*, 74 U. Chi. L. Rev. 761 (2007).

177.   *Id.* at 785–86; Sunstein, *supra* note 8, at 25.

178.   Emens, *supra* note 176, at 809.

179.   Sunstein, *supra* note 8, at 34.

180.   *See* Emens, *supra* note 176, at 774.

181.   *See id.* at 770–77. One can conceptualize Emens's claim as an argument that the status quo has appropriately adopted an antimajoritarian, social-welfare-maximizing, impersonal default rule, where gender equality plays a decisive role in the social-welfare calculus.

182.   *See id.* at 775–76.

to continue employing an impersonal default rule according to which marriage does not entail a surname change.[183] Many women will continue to change their names, overcoming the stickiness of the law's default term.[184] But nearly everything associated with marriage entails undoing a default choice. The default choice is to remain single. Once one decides to get married, the default choice is not to serve food at the wedding, to forgo flowers, to wear pajamas during the ceremony (or no clothing at all!), and to send no thank-you notes after receiving gifts. In short, defaults are not really relevant in these high-stakes settings. The point is simply that if the state adopts a popular but inegalitarian default, the result may reinforce existing gender inequality, both because of the power of inertia[185] and because of the expressive dimensions of the law.[186] We therefore agree with Emens and Sunstein that a crude personalized default, with gender as the only variable,[187] is normatively unattractive.

We think a more compelling case can be made for a granular personalized default rule. If one examines the name change data on which Emens relies, it is apparent that there are various demographic characteristics that substantially affect the probability that a spouse will adopt her husband's name upon marriage. A study of female Harvard alumnae showed that 20% of them kept their surnames, whereas a study of the overall population found that only 10% of married women did so. A more recent study of *New York Times* wedding announcements found that 29% of marrying women whose nuptials appeared in the paper of record were keeping their surnames.[188] Women with advanced degrees, women who married or became mothers later in life, graduates of elite universities, daughters-in-law of academics, and women whose husbands have PhDs were more likely to retain their surnames.[189]

Demographic variables affecting name changes interact in somewhat surprising ways. Education levels were highly predictive of whether Caucasian women would retain their surnames, but education had no effect on African American women's choices about keeping their surnames. African American women generally retain their surnames at significantly higher rates than Caucasian women do.[190]

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183. Recall that under the default-rule theory that seeks to maximize social welfare, societal values should be taken into account. *See supra* Section I.D.

184. Emens, *supra* note 176, at 813.

185. *Id.* at 815 ("[A]t least one study of marital names offers anecdotal evidence of a few women saying that they didn't change their names because they couldn't be bothered with the administrative hassle.").

186. *See* Richard H. McAdams, *A Focal Point Theory of Expressive Law*, 86 Va. L. Rev. 1649 (2000); Sunstein, *supra* note 8, at 20 (discussing the state's implicit endorsement via default rules).

187. The crude personalized default would be that men keep their surnames upon marriage, and women adopt their husbands' surnames upon marriage.

188. Emens, *supra* note 176, at 786 & n.85.

189. *Id.* at 787–89.

190. *Id.* at 788.

In light of this substantial variation, how should one feel about a highly granular personalized default rule? Suppose it turned out that Caucasian women who regularly shop at Wal-Mart, frequently dine at Cracker Barrel, dropped out of college, and are marrying spouses with similar characteristics adopt their husbands' surnames 98% of the time but that Asian American women who have a master's degree in education, subscribe to the *Vegetarian Times* and *Mother Jones*, and take yoga classes adopt their husbands' surnames only 7% of the time. Would it be normatively undesirable for the state to adopt as a default rule the assumption that Caucasian women with these characteristics would see their surnames changed upon marriage but the Asian American women would not? Imagine if the data showed that 88% of male, vegan, Prius drivers with PhDs in philosophy adopt their *wives'* surnames upon marriage. Why not flip the default for these husbands to a name change unless they opted out?

The red tape associated with a name change is nontrivial,[191] and it may be that at some point the demographic markers of an individual's preferences with respect to name changes are sufficiently strong that we need not worry so much about the law's expressive effects. Crude personalized default rules that are dependent on mere stereotypes are undesirable, but granular personalized default rules based on hard data and sound science may be desirable. Indeed, if data miners can drill down and find a set of men whose names ought to be changed by default, then even the expressive dimensions of the law may be ambiguous. What is more, the law's discomfort with relying exclusively on problematic classifications like race and gender may become less pronounced if these factors are mixed with a number of nonsuspect classifications to generate a default rule.[192]

Even crude, gender-based personalized decision rules may be appropriate when the dangers of reinforcing an inegalitarian gender norm are minor. *Nguyen v. INS*, a 2001 Supreme Court case, is one of the key precedents governing the law's use of gender proxies.[193] At issue in *Nguyen* was a government policy that imposed greater burdens on people seeking American citizenship who claimed to be the children of U.S. citizens born out of wedlock. The illegitimate children of U.S.-citizen fathers born out of wedlock could only become citizens if their fathers legally legitimated them, if their fathers declared their paternity under oath, or if a court order determined their paternity.[194] For the mothers, by contrast, maternity was presumed.[195]

Given the law's structure, the gender-discriminatory provision functioned as a default rule. While women's offspring were presumed to be citizens, men had to opt in to citizenship (through a declaration of paternity or

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191.   *Id.* at 817–18.

192.   *See* Grutter v. Bollinger, 539 U.S. 306, 336–41 (2003) (holding that a holistic higher education admissions process in which race is one of many factors considered survives strict scrutiny).

193.   533 U.S. 53 (2001).

194.   *Nguyen*, 533 U.S. at 62.

195.   *Id.*

legitimation) to receive the same rights for their offspring. The Supreme Court held that the gender classification was justified by two factors: first, the government's interest in ensuring that the person claiming citizenship and the U.S.-citizen father are indeed biologically related and, second, the state interest in ensuring that the person claiming citizenship has a meaningful relationship with the U.S.-citizen parent and, by extension, with the United States.[196] The majority rejected the idea that its decision was based on outmoded gender stereotypes:

> There is nothing irrational or improper in the recognition that at the moment of birth—a critical event in the statutory scheme and in the whole tradition of citizenship law—the mother's knowledge of the child and the fact of parenthood have been established in a way not guaranteed in the case of the unwed father. This is not a stereotype.[197]

The Court proceeded to hold that placing additional burdens in the path of the illegitimate children of U.S.-citizen fathers was substantially related to achieving important governmental objectives.[198] The Court emphasized that "Congress has not erected inordinate and unnecessary hurdles to the conferral of citizenship on the children of citizen fathers in furthering its important objectives."[199] The burdens are comparable on an applicant for citizenship and a woman defaulted into a surname change. The key considerations for a court would be whether accepting a default rule for surnames that is consistent with most American women's preferences is "marked by misconception and prejudice" or shows "disrespect for either class."[200] A court would also ask whether the preferences in question might be adaptive and whether they were shaped by a history of patriarchy.

In light of *Nguyen,* it is not certain that implementing a crude personalized default rule for surname changes upon marriage would be unconstitutional as a positive matter; the question is a close one. We continue to think that such a rule is undesirable for reasons that feminist legal scholars like Emens have articulated. Having said that, an advantage of granular personalized default rules, as opposed to crude gender-based distinctions, is that it may be easier to achieve doctrinal unity and popular consensus around such solutions—at least in a world where people do not care much about information privacy. A classic efficiency-versus-equity tradeoff thus arises. Crude personalized default rules, which conveniently mitigate the uncertainty problem associated with personalization, compound the constitutional problems associated with personalization.

We can generalize from Emens's example of name changes to any legal regime that incorporates a protected classification like race or gender into a granular personalized default rule. It is reasonable to survey the history of a

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196. *Id.* at 63–67.

197. *Id.* at 68.

198. *Id.* at 70.

199. *Id.* at 70–71.

200. *Id.* at 73.

state's race and gender discrimination and conclude that such classifications rarely ought to be part of the state's efforts to generate default rules. Indeed, as Sunstein notes, a major variable in determining whether the use of personalized default rules is appropriate is the trustworthiness of the "choice architects" who will frame and determine the contents of these rules.[201] But because gender and race can be reliable predictors of current preferences and future behavior, entirely excluding these variables from an algorithm leaves a great deal of predictive power on the table.[202] Most people would probably prefer an algorithm that knows their race and gender and, as a result, more accurately predicts their preferences over a system that excludes their race and gender from consideration and consequently provides them with less accurate default rules. Finally, the fragmented nature of the precedents in the gender- and race-discrimination context is important to underscore. The Supreme Court seems to be animated by different concerns in race cases than in gender cases, and antidiscrimination law is consequently far from coherent. While *Nguyen*'s defaults are the most relevant precedent, a comprehensive explanation of the constitutionality of personalized default rules would require a law review article unto itself.

H. *Privacy*

Information privacy restrictions make it more difficult to generate personalized default rules.[203] Without the ability to track individuals online, access comprehensive public and private databases, and use various other Big Data strategies, it will be quite difficult for firms and courts to generate personalized default rules. In the European Union, where regulators have generally taken a more aggressive approach to data privacy than their American counterparts,[204] such restrictions could well thwart the development of personalized default rules.

The privacy literature has long recognized the tradeoffs that information privacy entails. Scholars have explored the tension between privacy and security,[205] privacy and antidiscrimination,[206] privacy and gender equality,[207]

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201. Sunstein, *supra* note 8, at 8.

202. *See In re* Estate of Miltenberger, 737 N.W.2d 513, 519 (Mich. Ct. App. 2007) ("It remains an unfortunate fact that there are still circumstances in which the surviving wife may be significantly disadvantaged, in a way that surviving husbands generally are not, in the absence of dower, and the Legislature may properly consider such circumstances through the enacted dower statute.").

203. Sunstein, *supra* note 8, at 54–55.

204. Paul M. Schwartz, *The E.U.-U.S. Privacy Collision: A Turn to Institutions and Procedures*, 126 Harv. L. Rev. 1966, 1974–79 (2013).

205. *See, e.g.*, Richard A. Posner, *Privacy, Surveillance, and Law*, 75 U. Chi. L. Rev. 245 (2008); Daniel J. Solove, *Data Mining and the Security-Liberty Debate*, 75 U. Chi. L. Rev. 343 (2008).

206. Lior Jacob Strahilevitz, Information and Exclusion 127–56 (2011).

207. *See, e.g.*, Reva B. Siegel, *"The Rule of Love": Wife Beating as Prerogative and Privacy*, 105 Yale L.J. 2117 (1996).

and privacy and innovation.[208] We can understand the privacy–personalization tradeoff in similar terms. One of the unanticipated consequences of aggressive data-privacy regulations will be a series of shifts toward impersonal default rules and away from personalized default rules, from granular personalized default rules to crude personalized default rules, and (as we shall see) from personalized disclosure to impersonalized disclosure.

The industry attack on "Do Not Track" rules that would govern the collection of information about consumers' internet activities has been largely focused on the benefits of personalized advertisements to consumers as well as their obvious benefits to industry. Making consumers aware of the potential benefits from personalized defaults and personalized disclosure may, in the long run, prompt fewer consumers to try to thwart tracking. After all, most consumers bring strongly pragmatic perspectives to privacy tradeoffs, and they are increasingly willing to share information about themselves when the benefits from sharing are increased and the threats from sharing are diminished.[209] There is obviously another potential wrinkle here. The primary debate over Do Not Track has been about the appropriate default rules. Industry groups are open to permitting individuals to opt out of tracking, but they want to require an affirmative step by consumers to reject a protracking default rule embedded in web browsers.[210] Many marketing firms have said they will not honor Do Not Track requests sent by consumers using Microsoft's Internet Explorer, which turns on Do Not Track by default.[211]

Paradoxically, one way around the current stalemate may be to use our lack of privacy to further privacy interests. If a consumer's existing profile reveals that she cares a great deal about her own information privacy, and if her behavior mirrors that of guinea pigs who chose to protect their own privacy online, then it should be straightforward to enable Do Not Track by default for that consumer. Similarly, if a consumer's existing profile reveals minimal concern for privacy and has similar characteristics to those of the guinea pigs who decided to enable tracking online, then permitting tracking

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208.   *See, e.g.*, Ethan S. Bernstein, *The Transparency Paradox: A Role for Privacy in Organizational Learning and Operational Control*, 57 Admin. Sci. Q. 181, 202–04 (2012); Julie E. Cohen, *What Privacy Is For*, 126 Harv. L. Rev. 1904, 1918–27 (2013).

209.   Alan F. Westin, *"Whatever Works": The American Public's Attitudes Toward Regulation and Self-Regulation on Consumer Privacy Issues*, Nat'l Telecomm. & Info. Admin., http://www.ntia.doc.gov/page/chapter-1-theory-markets-and-privacy (last visited Mar. 26, 2014); *see also* Consumer Intelligence Series, PricewaterhouseCoopers, Consumer Privacy: What Are Consumers Willing to Share? 1–4 (2012), *available at* http://www.pwc.com/us/en/industry/entertainment-media/assets/pwc-consumer-privacy-and-information-sharing.pdf. Approximately 16% of the American population is privacy unconcerned, with respondents saying that no corporate uses of their personal information would violate their personal privacy boundaries. *Id.* at 8.

210.   Natasha Singer, *Do Not Track? Advertisers Say "Don't Tread on Us"*, N.Y. Times, Oct. 14, 2012, at BU3, *available at* http://www.nytimes.com/2012/10/14/technology/do-not-track-movement-is-drawing-advertisers-fire.html.

211.   *Id.*

ought to be the appropriate default option. Using personalized defaults in this way is appealing in contexts like online privacy where defaults appear to be very sticky.[212] Note that although enforcing a Do Not Track rule against firms is costly, it is straightforward to enforce an evidentiary rule limiting the admissibility of information from tracking to affect the personalized default rule that applies to a particular consumer. Familiar problems of adverse selection and unraveling will remain, with bad-credit types and high-privacy-concern types potentially becoming pooled,[213] but this is not a problem unique to personalization. At the margins, the benefits of personalized default rules will prompt more consumers to surrender private information, a development that is positive in efficiency terms but problematic to theorists who argue that privacy produces positive externalities.[214]

I.   *"But I Can Change!" and Opting In*

Before turning to a further extension of personalization, we hope to clarify one last point about our proposal for personalized default rules. Sunstein notes that the "best default rules or settings for a particular person in one year might be very different from those in the next year. The default rules could change on a daily or even hourly basis."[215] We are skeptical about the underlying assumptions of this objection. We think that most choices about default rules are partially driven by values and personality characteristics, which longitudinal research shows to be quite stable once a person reaches adulthood.[216] Personality seems to have a strong genetic component

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212.   The default provisions contained in the Gramm-Leach-Bliley Act concerning the downstream sharing of consumers' financial information are extraordinarily sticky, with only one in 200 consumers opting out of the prosharing statutory default. *See* Edward J. Janger & Paul M. Schwartz, *The Gramm-Leach-Bliley Act, Information Privacy, and the Limits of Default Rules*, 86 Minn. L. Rev. 1219, 1230 (2002).

213.   *See* Scott R. Peppet, *Unraveling Privacy: The Personal Prospectus and the Threat of a Full-Disclosure Future*, 105 Nw. U. L. Rev. 1153, 1177–82 (2011); Strahilevitz, *supra* note 68, at 2021–22, 2030.

214.   *See, e.g.*, Anita L. Allen, *Coercing Privacy*, 40 Wm. & Mary L. Rev. 723 (1999); Paul M. Schwartz, *Property, Privacy, and Personal Data*, 117 Harv. L. Rev. 2055 (2004).

215.   Sunstein, *supra* note 8, at 53.

216.   A longitudinal study that tracked people's personality over a nine-year period from ages thirty-three to forty-two found very high levels of consistency in each of the Big Five characteristics among both men and women. *See* Johanna Rantanen et al., *Long-Term Stability in the Big Five Personality Traits in Adulthood*, 48 Scandinavian J. Psychol. 511, 515 (2007) (showing an average correlation coefficient of .85 for men and .78 for women). Personality tends to be far less stable across longer periods of time or between young adulthood and late adulthood, although some studies show correlation coefficients in the .20 to .38 range for some of the Big Five across decades. *See, e.g.*, Sarah E. Hampson & Lewis R. Goldberg, *A First Large-Cohort Study of Personality-Trait Stability over the 40 Years Between Elementary School and Midlife*, 91 J. Personality & Soc. Psychol. 763 (2006); Stephen Soldz & George E. Vaillant, *The Big Five Personality Traits and the Life Course: A 45-Year Longitudinal Study*, 33 J. Res. Personality 208 (1999).

and be heritable.[217] That said, we recognize that people sometimes change in ways that might cause them to want wholesale revisions in their preferences. We therefore want to underscore that personalization is *itself* a default rule that can be waived. Suppose a consumer has a change of heart. She recognizes in the past that she has been risk seeking, inattentive, and price insensitive. A divorce, a bankruptcy, or a stint in rehab convinces her that she ought to turn over a new leaf. Under our proposal, she need not be stuck with the choices made by her former self. To escape the consequences of her consumer profile, she may specify that she rejects personalized defaults. She can specify that she instead wants to contract for the impersonal majoritarian default rule, or an impersonal minoritarian default rule, or randomized selection of default rules, or any other set of decision rules to which the counterparty might agree. Indeed, with the consent of the counterparty, a consumer might specify (through a contract) that the contract will be governed by the personalized default rules that would apply to a (presumably admirably rational) third party. "We hereby reject the Porat–Strahilevitz proposal for personalized default rules as a basis for interpreting this contract" would be a valid and enforceable contractual provision, as would, "We hereby agree that the promisee shall be entitled to the personalized default rules that would apply were this to be a contract between the promisor and Ralph Nader." Alternatively, we are quite open to tweaking our proposal so that present-day impersonalized default terms are the default choice for everyone, and individuals who would like their terms to be personalized opt into doing so, either with a blanket opt in or particular opt ins for personalization in discrete settings.

IV. Personalized Disclosure

The question of default rules has long vexed legal scholars and prompted an enormous academic literature. In the last few years, the topic of disclosures has become another hotbed of legal scholarship. In their noteworthy recent work, Omri Ben-Shahar and Carl Schneider argue that disclosure to consumers rarely achieves what its advocates claim, in part because disclosures have a pronounced tendency to become longer and more complicated over time.[218] Disclosure mandates accumulate in legislation and regulations, and, as a result, the disclosures themselves get so lengthy and cumbersome that consumers stop reading them entirely.

Our personalized-disclosure solution to the problems that Ben-Shahar and Schneider identify should be obvious to readers by now, and it is surprising that it is an approach largely absent from the broader literature on

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217.   Kerry L. Jang et al., *Heritability of the Big Five Personality Dimensions and Their Facets: A Twin Study*, 64 J. Personality 577, 577 (1996).

218.   Omri Ben-Shahar & Carl E. Schneider, *The Failure of Mandated Disclosure*, 159 U. Pa. L. Rev. 647, 684–90 (2011).

disclosure. We have already shown how personalization might improve doc-tor–patient disclosures.[219] In this Part, we extend the idea to disclosure more broadly.

Let us begin with the least controversial form of personalized disclosure: tailored communicative strategies. Advertisers have long understood that particular communicative methods might have varying effectiveness in reaching individuals with divergent personalities. This basic Madison Avenue assumption is buttressed by the available social science research.[220] Now suppose that the government wishes to convey a particular message to the citizenry in a way that will maximize its impact. Suppose the government seeks to encourage new parents to put their infants to sleep on their backs to reduce the risk of Sudden Infant Death Syndrome ("SIDS"). Or suppose the state wants to convince as many people as possible to evacuate from an area in the path of a Category 4 hurricane, both to reduce the residents' risk of death and to minimize the threat to first responders who might have to rescue those who refuse to evacuate. A government that knows nothing about its individual citizens' personalities must broadcast a message de-signed to appeal to the majority. A government that knows its citizens' per-sonalities and can narrowcast to defined groups of individuals with common traits might tailor the state's warnings in a way much more likely to per-suade them.[221] Just as it is sensible for the state to use different languages to communicate with non-English-speaking populations or to tailor to teens public service ads that are designed to discourage smoking, it is appropriate for the state to try to use psychological insights to tailor the packaging of information in a manner designed to prevent the unnecessary deaths of, say, babies or police officers.

If tailoring the communicative strategy to a group of people with similar personality traits is uncontroversial, then altering the contents of the mes-sage should be acceptable as well, as long as all the information provided is truthful. Where consumers are purchasing items online, we propose a re-gime whereby their Big Data profiles help determine which disclosures they see.

The advantages of such a regime are apparent. When online disclosures occur today, single males who live alone are shown warnings about the ef-fects that prescription medication may have on pregnant women. Childless seniors living in age-restricted communities are warned about how house-hold goods may have small parts that toddlers can break off and swallow. Devout Mormons are warned about the effects of mixing a particular phar-maceutical with alcohol. The proliferation of warnings targeted toward a small set of potential consumers greatly lengthens disclosures, heightening

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219.   *See supra* Section II.B.3.

220.   *See, e.g.*, Jacob B. Hirsh et al., *Personalized Persuasion: Tailoring Persuasive Appeals to Recipients' Personality Traits*, 23 Psychol. Sci. 578 (2012).

221.   *Cf. id.* at 580 ("Tailored messages are considerably more effective than one-size-fits-all campaigns, and the effectiveness of tailoring increases with greater customization and adap-tation to the unique features of the recipient." (citations omitted)).

the risk that a consumer will fail to see the one or two warnings that are very pertinent to people just like him. Too much disclosure can be as bad as too little disclosure because both result in a consumer retaining too little pertinent information. We submit that the disclosure strategy can be rescued and rejuvenated by a personalization strategy that makes the disclosures each consumer sees shorter and more relevant.

As technology improves, we would anticipate this sort of personalization of disclosures occurring even in brick-and-mortar supermarkets, shopping centers, and hardware stores.[222] Twentieth-century disclosure technology involved a printed label with finite space and constraints on how much manufacturers could shrink font sizes to cram more information into those spaces. Twenty-first-century disclosure technology ought to take advantage of the fact that a significant proportion of consumers now shop with smartphones that can scan bar codes.[223] Personalized disclosure applications would enable a consumer to scan a product at the point of sale and to see only the disclosures and warnings likely to be relevant to him. We believe the health and safety gains from such innovation could be substantial. Personalizing disclosures will reduce the time that is wasted when people have to see irrelevant disclosures and reduce the frequency with which people fail to notice a key disclosure that is buried amid many irrelevant disclosures.

We believe this proposal for personalized disclosure is novel. Although we think our idea is intuitive, we are unaware of any academic literature discussing the prospects of using Big Data to personalize the disclosures that individuals receive. The new literature on "Smart Disclosure" proposes that in some contexts, like cell-phone plans or energy usage, vendors would be required to provide consumers with data about their individual usage patterns, which consumers could then use to compare products and services on shopping web sites. Armed with this information, consumers could see what different firms charge customers whose expected use of a service mirrored theirs.[224] Our approach has many of the same virtues, although it aims to be less cumbersome and therefore more useful to the consumer; it also tries to mitigate an information overload problem that Smart Disclosure does too little to solve. Another close cousin in the literature is a recent article by Gil

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222. For a thoughtful article exploring possible uses of these technologies in consumer contracting at the point of sale, see Peppet, *supra* note 101.

223. Kavita Kumar, *Shoppers with Smartphones Put Retailers in Glass Boxes*, Sᴛ. Lᴏᴜɪs Pᴏsᴛ-Dɪsᴘᴀᴛᴄʜ, Feb. 15, 2011, at A1, *available at* http://www.stltoday.com/business/local/mobile-shoppers-shaking-up-retail-industry/article_4fccd0af-7447-5f2f-8f81-45d52e56520b.html.

224. *See, e.g.*, Richard H. Thaler & Will Tucker, *Smarter Information, Smarter Consumers*, Hᴀʀᴠ. Bᴜs. Rᴇᴠ., Jan.-Feb. 2013, at 3; Elisa Brody, Product Attribute Information and Product Use Information: Smart Disclosure and New Policy Implications for Consumers' Protection (Sept. 25, 2013) (unpublished manuscript), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2142734.

Siegal, Richard Bonnie, and Paul Appelbaum that discusses personalized disclosure in medicine.[225] Their version of "personalized disclosure" differs from ours, and we think it lacks some of the advantages of our approach. Their first approach to personalized disclosure asks patients at the outset whether they would like to receive: (a) very detailed and precise disclosure of side effects and medical risks, including information likely to interest only a small subset of patients; (b) moderately detailed and general disclosure of side effects and risks, where minor and insignificant risks are not disclosed to the patient; or (c) very basic disclosures, such as the reasons for the treatment and the likely period of time the patient will have to miss work.[226] They view the patient's choice about how much disclosure to receive as legally significant: "once a patient has stated his preferences and the procedure has taken place, he may no longer argue in court that the informed consent process was inadequate in that it failed to provide him with the information he needed."[227]

Siegal and his coauthors also identify a second form of personalized disclosure, which they seem to prefer. Under that approach, disclosure would occur via software that enabled the patient to click on hyperlinks to find out more about particular risks, side effects, or tradeoffs.[228] The software would record a transcript of what the patient asked to see and did not ask to see, and this transcript would be admissible evidence in any subsequent litigation over informed consent.[229]

We think Siegal's proposal is a step in the right direction, but as Big Data proliferates and the technologies underlying FICO Adherence Scoring improve, we think there is a strong case to be made for preferring our version of personalized disclosure. Answering many questions about whether one wants to read a particular paragraph may increase the stress levels of patients, particularly those who know that by selecting the minimal disclosure option or failing to click on a particular hyperlink they will be waiving various legal rights. A regime that scrutinizes the choices that representative guinea pigs have made with the benefit of full information may be a more sensible way to proceed.[230]

Indeed, guinea pigs might work differently in the personalized-disclosure context. We envision compensating guinea pigs to read various disclosures and to evaluate (both immediately and several weeks after the

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225.   Siegal et al., *supra* note 115, at 359. Peppet's article has one sentence flagging the possibility that the warnings a customer sees at the point of sale could depend on the preferences that the customer previously entered into his smart device. Peppet, *supra* note 101, at 730.

226.   Siegal et al., *supra* note 115, at 361–62.

227.   *Id.* at 362.

228.   *Id.* at 363.

229.   *Id.* at 364.

230.   To the extent that a patient or consumer is informed of the right to opt out, it may cause some stress, especially during the transition to personalized disclosure. Decisions to trust guinea pigs will resemble leaps of faith that would decrease as time passes and as consumers become more comfortable with using guinea pigs' preferences as proxies.

treatment at issue) how useful the disclosed information proved to be. Non-guinea-pig patients would then be paired with the choices made by the guinea pigs with personalities and attributes most similar to theirs. The key point is that different warnings will be helpful in different ways to different sorts of people. Personalized disclosure thus identifies the warnings that were useful to "people like you" or "people like those in your household" and only provides you with those warnings unless you opt for more complete disclosure. Parents whose children have peanut allergies will constantly see peanut-related warnings about products they are considering—including perhaps an "Are you sure?" message in the checkout line; parents whose own children do not have allergies but who may be bringing snacks for a kindergarten class will need to opt in to receive allergen information when circumstances require such additional precautions. We anticipate that these sorts of personalized disclosures will save consumers a great deal of time. More importantly, however, they will prompt more consumers to read carefully health and safety disclosures.

We anticipate that such personalized disclosures are likely to take root in the area of consumer warnings and may spread to other domains as well. For example, a smartphone application that knows, based on Big Data and guinea pigs, that you are likely to be concerned about particular sorts of risks can also learn that you are concerned about particular contractual provisions. Most people may not care about the terms of clickwrap software agreements, but some users may be sensitive about particular rights, responsibilities, and waivers. Through automation, an application could do what a good lawyer already does—read the contract and advise the client about provisions that may be problematic in light of the client's idiosyncrasies. Here, again, consumers could benefit from the close scrutiny that compensated guinea pigs would devote to reading all the pertinent contractual provisions.

Personalization may play a similar role in the context of governmental disclosures. For example, just as we might want the government to tailor its warnings about SIDS to audiences with different personalities,[231] it may make sense for the government to target air quality warnings directly to asthmatics (and their parents) instead of broadcasting such warnings through mass-media outlets unlikely to pay them much heed. A city government that knows our daily commute patterns (because we have agreed to share them) can let us know about accidents along the route while staying silent about accidents on other highways in the metropolitan area. Under the status quo, consumers and voters can always "pull" such information out of the public sphere, but doing so can be difficult and costly. Personalized disclosure may often be the most efficient mechanism for pushing the right information to the right people, assuming the state can be trusted to put information about individual citizens to appropriate uses.

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231. *See supra* text accompanying notes 220–221.

Finally, we think there is an important role to play for personalized disclosures in personalizing default rules. Of course, some consumers will respond better than others to the possibility that they are entering into a contract whose terms are dependent on choices made by others. Consumers whose profiles suggest that this level of uncertainty is likely to upset them might receive additional disclosures about anticipated directions of those changes and be given easy opportunities to reject such changes. Consumers whose profiles indicate an interest in saving money wherever they can—even if it means more onerous contractual terms—might receive regular notices about terms that could be modified if the customer wishes to realize a cost savings. Other consumers, who rarely elect to pay less in exchange for fewer contractual rights, would receive fewer notices of this kind. In short, there are many ways in which personalized disclosure could address some of the complexity problems that arise with personalized contracts. Personalized disclosures can help consumers determine what their existing profiles indicate about the meaning of a contract they are contemplating signing and how their profiles are influencing the contractual terms. Where similar guinea pigs are not unified over which terms are best, the consumer may be presented with active choices among several default terms or instructions on how the default might be altered.

While there are many objections to personalizing default rules, we think that the objections to personalized disclosure are fewer and less significant. As with default rules, an individual could always request disclosure of a greater amount of information than what personalization suggests, and we would want these choices to be honored. Given this possibility, it is hard to imagine that individuals would engage in strategic behavior to affect the disclosures to them, and a personalized disclosure regime can easily accommodate changes in individuals' personalities and preferences. Concerns about cross subsidies do not arise with respect to personalized disclosure, nor do concerns about uncertainty or fragmentation. And it seems unlikely that the government would find constitutional objections to personalized disclosure—the state regularly makes judgments about which messages should be conveyed to which audiences, and it seems hard to believe that even race-based messaging, such as extra warnings to African Americans about the dangers of sickle cell anemia, is constitutionally problematic. The potential downsides of personalized disclosure, then, seem confined to misgivings about stereotyping and privacy. There may also be worries about whether courts are really willing to countenance the possibility that someone might not receive a warning about an extremely unlikely side effect of a drug based on his personality profile and then, due to some fluke, this low-probability side effect manifests itself.[232] In such circumstances, courts should not award compensation. Social insurance, rather than the tort system, is the best mechanism for compensating victims, given the inability of

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232.   By contrast, we would support legal liability for negligent or reckless profiling that results in harm because an individual was incorrectly categorized.

would-be defendants to reap fully the benefits of nondisclosure resulting from personalization.

To summarize, we think that personalized disclosures may be the wave of the future, too. They have the potential to minimize consumers' information-overload problem and to prompt them to start paying attention once again to pertinent disclosed information. And they even have the potential to alter, for the better, the way that contracting is done.

Conclusion

The idea of personalized default rules has been in the air for several decades. Although the origins of our inquiry can be found in Ayres's essay, which was published twenty years ago, no one has developed a comprehensive account of personalized default rules. Sunstein took the idea an important step further and pointed out some of the main benefits and drawbacks of a personalized default-rule regime compared with impersonal defaults and active choices. Our Article, then, has finally developed a comprehensive framework for understanding the theoretical and practical issues arising in the implementation of personalized default rules.

Along the way, we have contributed several innovations. For example, we have shown how providing a limited number of guinea pigs with resources to make rational decisions, and using these guinea pigs' choices to generate the default rules that will be presented to the most similar members of the general public, makes personalization substantially more attractive. We have explained how majoritarian and minoritarian default rules might be made more effective through personalization. And we have broken down the category of personalized default rules into crude personalized defaults (which are more easily predictable for the parties, applied with more certainty by adjudicators, less precise, and more impervious to strategic behavior) and granular personalized defaults (which have the opposite costs and benefits). Perhaps most interestingly, we have shown that personalization may present an important way forward, not only for default rules but also for various disclosures to consumers and the citizenry. As we have demonstrated, the most powerful critiques that have been lodged against disclosure are largely products of disclosure's impersonal nature. The disclosure strategy can be resuscitated via personalization.

Why has it taken the literature so long to reach this juncture? We believe the answer is that until recently, technological constraints would have rendered our approach wildly unrealistic. But the Big Data revolution fundamentally changed the equation, at least in the United States. Now more than ever, implementing a personalized default-rule regime is attainable, and personalized disclosures are within reach, given minor improvements in the social science research and applicable technology. Big Data has its own economic momentum, but we have endeavored to show how its development might open up new possibilities for legal intervention. To that end, we call

on legislatures and courts to respond to the challenge proposed in this Article by considering personalized default rules for consumer contracts, contracts between repeat players, inheritance law, medical malpractice, and landlord–tenant law.

Legislatures should consider tailoring personalized default rules, at least in those areas when it is quite obvious that the law's goals could be better achieved with such rules and where implementing them is feasible and not too costly. Thus, in inheritance law, intestacy rules should be personalized in accordance with existing data, provided a bit more research is conducted about whether the preferences and characteristics of intestates differ from those of testators of the same gender. Courts hearing medical malpractice suits should allow doctors to argue that they adopted a disclosure practice that is consistent with the personal characteristics of their patients, as revealed by FICO Adherence Scores and other data-driven patient profiling technologies. Courts should also avoid applying constitutional rules developed before personalization could be contemplated in a manner that suffocates personalized rules in their infancy. Regulators should fund pilot projects to facilitate personalized disclosure, and legislators might create safe-harbor provisions to encourage manufacturers, retailers, and service providers to begin innovating with personalized disclosures in the private sector.

We realize that personalizing default rules and disclosure is costly. There is often a tradeoff here, somewhat similar to the rules-versus-standards tradeoff, between certainty and accuracy: more personally detailed default rules could increase accuracy but at the same time create uncertainty for courts applying default rules to disputes and for private actors trying to anticipate what courts might do. Because the tradeoffs can be significant, we advocate beginning with personalized default rules in the easiest cases, followed by incremental advances if the early results are promising.

Personalized default rules and personalized disclosure are just two important pieces of a more ambitious idea, which is personalized law *in general*. One could imagine a legal system where criminal law, constitutional law, tort law, and property law are personally tailored to people's preferences and characteristics. Indeed, aspects of these bodies of law are already personalized to some degree. Consider insanity defenses or the Sentencing Guidelines in criminal law, litigant sensitivity in First Amendment law,[233] the eggshell skull doctrine in tort law,[234] and the focus on a landowner's "distinct, investment-backed expectations" in takings doctrine. We might anticipate far more granular and data-driven personalization in each of these domains during the coming years. Envisioning such a legal system is beyond our present project, and the conversation becomes increasingly fraught as

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233.   *See* Adam M. Samaha, *Litigant Sensitivity in First Amendment Law*, 98 Nw. U. L. Rev. 1291 (2004).

234.   *See, e.g.*, Dennis Klimchuck, *Causation, Thin Skulls, and Equality*, 11 Can. J.L. & Jurisprudence 115, 124 (1998).

the idea is stretched from contract to criminal settings.[235] Nevertheless, we believe the case for trying personalized default rules and personalized disclosure in various contexts is sufficiently compelling to warrant near-term experimentation.

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235.   One research paper suggests that juvenile recidivists and nonrecidivists differ significantly in terms of Big Five agreeableness and neuroticisms, with repeat offenders scoring higher on neuroticism and lower on agreeableness. The paper also finds that offenders in general are less agreeable and less open to new experiences than nonoffenders. Coleta van Dam et al., *PEN, Big Five, Juvenile Delinquency and Criminal Recidivism*, 39 Personality & Individual Differences 7, 14 (2005). *If* these results are generalizable—the research is very sparse—they suggest that personality might be relevant in personalizing sentencing and parole decisions as well as in developing offender profiles. That said, we have normative misgivings about such an approach to criminal law in light of concerns about stigmatization, incorrect use, and manipulability. These concerns become particularly forceful in light of personality's strong genetic component. *See* Jang et al., *supra* note 217, at 577. But if determining personality through Big Data is relatively straightforward, if personality might predict aspects of criminality and recidivism, and if the government has access to a large store of data about individuals, then it is conceivable that governments around the world already employ (or will soon employ) such techniques.