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PERSONALIZING DEFAULT RULES AND DISCLOSURE WITH BIG DATA

Ariel Porat and Lior Jacob Strahilevitz

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PERSONALIZING DEFAULT RULES AND DISCLOSURE WITH BIG DATA

Ariel Porat[*] & Lior Jacob Strahilevitz[**]

Abstract:

This paper 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 paper 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 paper then shows how personalization might improve existing approaches to the law of consumer contracts, medical malpractice, 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, and other fields.

Let us illustrate our approach with an example from inheritance law.

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Empirical research has shown that married fathers are more likely than married mothers to bequeath all their property to their spouse (55 percent compared to 34 percent).[1] Moreover, according to those studies men bequeath significantly larger shares of their estates to their spouses (80 percent of estates are willed to widows versus 40 percent to widowers). This data is 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, at the expense of children from their first marriage.[2]

If men's testamentary preferences differ systematically from women's, why should intestacy laws continue to be gender-neutral?[3] 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 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.

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 analysis of his consumer behavior during his lifetime. In an era of Big Data, 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 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.[4] An upshot of widely employing this approach is that more estates would be allocated in a way that better approximates the true preferences of

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

[2] Debra S. Judge, *American Legacies and the Variable Life Histories of Women and Men*, 6 HUMAN NATURE 291 (1995).

[3] We will simplify the analysis by assuming that the decisions of 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 intestates die at a younger age than testators on average); 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 individuals who die with a will, and that this factor may engender selection effects).

[4] For much more on guinea pigs, *see infra* Section II.C.

the decedent. Given the fact that most individuals leave no wills, that could be a significant advantage. 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, more closely approximating what they would have wanted than 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 two alternatives to them: active choices and personalized default rules.[5] 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,[6] and continued 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.[7]

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."[8] 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 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.[9] He inventively envisions personalized default rules in contexts like the choice of retirement plans, cell phone plans, mortgages, and other settings.[10] That

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[5] Cass R. Sunstein, *Impersonal Default Rules vs. Active Choices vs. Personalized Default Rules: A Triptych*, Regulatory Policy Program Working Paper RPP-2012-17 (2012). 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.

[6] Ian Ayres, *Preliminary Thoughts on Optimal Tailoring of Contractual Rules*, 3 S. CAL. INTERDISCIPLINARY L. J. 1, 4 & n.15 (1993); *see also* Ian Ayres & Robert Gertner, *Majoritarian v. Minoritarian Defaults*, 51 STAN. L. REV. 1591, 1593, 1596-1606 (1999) (identifying several types of contracting party heterogeneity, and showing how they might affect the law's choice among defaults preferred by the majority or those preferred only by a minority of contracting parties).

[7] George S. Geis, *An Experiment in the Optimal Precision of Contract Default Rules*, 80 TULANE L. REV. 1109 (2006) (examining the trade-off between simple and complex default rules).

[8] Sunstein, *supra* note 5, at 25.

[9] *Id*. at 3-4.

[10] *Id*. at 24.

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 personalized default rules would be applied by courts. 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.[11]

No scholars have previously offered a comprehensive theory of personalized default rules, nor has anyone explored the feasibility of such an approach in detail. 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 the creation of certainty surrounding the meaning of default terms to heterogeneous individuals and firms. By mitigating so much of 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 thinking on default rules, identifying the dominant strategies for supplying default rules: majoritarian default rules, and minoritarian (penalty) default rules. It then shows how each of these two types of default rules might be improved via personalization, such that the contents of the rules in question will differ among heterogeneous individuals. In this Part we illustrate our claims mostly through consumer contracts and point out the main considerations which could make 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 they 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 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 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

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[11] *See* Geis, *supra* note 7, at 1124-29 (discussing the expected costs of having tailored default rules); Ayres, *supra* note 6 (analogizing the tailored vs. untailored default rule dilemma, with the rules vs. standards debate).

terms chosen by the guinea pigs whose observed behavior and characteristics most closely match their own.

Part III considers a number of important objections to our proposal for personalizing default rules. These serious objections include concerns about unfair cross-subsidies, strategic behavior by consumers, uncertainty and the fragmentation of case law interpreting contractual language, using statistics and creating 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 behavior 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, 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. Our 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. We instead propose a regime of "personalized disclosure" whereby data about individual preferences, characteristics, and predilections will 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 see only the warnings likely to be of greatest interest to those similarly situated. This is how a family physician or a small-town pharmacist's disclosure to a well-known patient has long proceeded. But it is not the way that disclosure works for consumer products or medical services generally. Our insight is that the powerful existing critiques of disclosure remedies are not critiques of disclosure as such, but rather critiques 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 association 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, which apply to their transactions unless they explicitly or implicitly reject them.[12]

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.[13] 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"[14] because biases and cognitive constraints prevent people from contemplating their future death and the transaction costs associated with creating a will can be high.

Under the most influential default rule theory, which we discuss in detail below,[15] default rules are aimed at decreasing transaction costs. In order for default rules to achieve this goal, they generally should 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, and opting out is costly. Furthermore, sometimes the parties would not opt out of undesirable default rules, because opting out is too costly, and they will 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 in the absence of such transaction costs; thus, reducing transaction costs by providing the parties with default rules they prefer sometimes facilitates deals.

The legal literature has long recognized that default rules should be tailored to specific types of transactions, until the point at which finer tailoring is not cost justified, namely, when additional tailoring will increase rather than decrease transaction costs.[16] Although default rules are

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[12] *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 notes. 13,14 (2004) (arguing that courts should complete gaps in contracts using rules that are most likely to be desired by the parties in order to reduce writing costs).

[13] *See* Conn. Gen. Stat. §45a-437 (2012) (determining intestate succession in the state of Connecticut); Cal Prob. Off. Div. 6, Pt. 2 (determining intestate succession in the state of California); 18-A M.R.S. § 2-101 (2012) (determining intestate succession in the state of Maine).

[14] *See* Omri Ben-Shahar & John Pottow, *On the Stickiness of Default Rules*, 33 FLORIDA STATE 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).

[15] *Infra* Section A.1.

[16] Ian Ayres & Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory*

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

A. Contract Law Default Rules

If contracting parties were required to agree upon all the terms of their contracts, negotiation would be endless, drafting costs would skyrocket, 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 implicitly or explicitly rejected by the parties.[17] 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..." The parties now do not need to agree beforehand on the place of delivery, since as long as they do not say otherwise, delivery would take place at the seller's place. 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." The U.C.C. proceeds in clarifying in details what merchantability means.[18] 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.[19] Indeed, the parties' power to opt out

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of Default Rules, 99 YALE L.J. 87, 117-8 (1989) (arguing that adopting tailored rules to fill gaps in the contract, creates costs of distinguishing different types of parties and transactions); Ayres, *supra* note 6 (arguing that when decision maker creates a tailored default rule she should account for both precision and complexity).

[17] COOTER & ULEN, *supra* note 12, 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 12, at 302 notes 13, 14 (arguing that when parties leave gaps in the contract courts should fill these gaps by adopting an interpretation method that minimizes the sum of writing costs and the costs of errors in the interpretation).

[18] U.C.C., § 2-314(2) (detailing the conditions under which goods are considered merchantable).

[19] RESTATEMENT (SECOND) OF CONTRACTS § 356 (1981) (stating that the parties can decide in advance the damages payable in case of breach, and that such an agreement replaces the courts inquiry about the correct level of damages); E. ALLAN FARNSWORTH, CONTRACTS §12.18 (4d ed. 2004) (stating that parties can agree upon remedial rights, different than the

of the "full compensation" default rule is limited: courts could strike down a liquidated damages clause as a penalty[20] or use the doctrine of unconscionability to refuse to enforce exclusionary clauses in consumer contracts, especially when they exonerate the merchant from liability for bodily injury.[21]

B. Majoritarian Default Rules

1. In General

Under the majoritarian default rules theory, which is the most accepted and influential one 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 upon, if they had considered it as an option when making their contract.[22] Thus, if most contracting parties in a sales contract prefer delivery of the goods to take place 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 at decreasing transaction costs, they should fit the transactors' preferences as closely as possible. There would always be parties that prefer a rule different than the one preferred by the majority, and they would have to opt out of the default rule, thereby incurring transaction costs. But the majority of the transactors would not opt out, thereby saving the transaction costs they would have incurred but for the default rule.[23]

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

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remedies usually supplied by the courts).

[20] FARNSWORTH, *id*., *id.* (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); RESTATEMENT (SECOND) OF CONTRACTS, *supra* note 19, *id*. (stating that the parties' power to set liquidated damages is limited, and that the liquidated damages provision must regard the principle of compensation).

[21] 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.").

[22] COOTER & ULEN, *supra* note 12, at 293-4 (arguing that courts should impute terms in the contract that the parties would have agreed upon if they had negotiated the term in advance); David Charny, *Hypothetical Bargains: The Normative Structure of Contract Interpretation*, 89 MICH. L. REV. 1815, 1820-3 (1991) (arguing that default rules should be the most likely result of a hypothetical bargaining between the parties).

[23] COOTER & ULEN, *supra* note 12, at 294 (arguing that the efficient default rule is preferable because most parties would not wish to opt-out, and that will save transaction costs).

and increase benefits, thereby increasing the surplus of their contract, which they can divide among themselves.[24] Therefore, the majoritarian default rule should be efficient. Thus, according to this view, if in most cases the costs of 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 and reduce expected losses compared to reliance damages, an expectation damages default rule is superior to a reliance damages default rule.[25] Note that one should 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.[26]

Default rules can be context-sensitive, which is a nod in the direction of personalization.[27] 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, there could be enough situations, and enough types of contracts, where most parties would have the opposite preference. While the more common remedy under American contract law is damages,[28] when the contract is for the sale of a unique

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[24] 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 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"); 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 the parties to invest in the contract to the level that maximizes the joint surplus)

[25] See Steven Shavell, *Damage Measures for Breach of Contract*, 11 THE BELL J. OF ECON. 466 (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, 1573-4 (2009) (arguing that the promisor's option to breach and pay expectation damages is a default rule incorporated into an incomplete contract); COOTER & ULEN, *supra* note 12, at 287-9 (arguing that expectation damages usually give better incentives to the promisor, and therefore are superior to reliance damages).

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

[27] *See* Ayres, *supra* note 6, at 4-6 (arguing that when decision maker creates a tailored default rule she should find the optimal point in which the rule is specific enough but not too complex); Geis, *supra* note 7 (modeling the simplicity-complexity dimension of default rules, and suggesting that under certain assumptions a simpler, though less accurate, default rule would better reduce transaction costs).

[28] FARNSWORTH, *supra* note 19, at §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).

good, courts are commonly willing to grant a remedy of specific performance.[29] Instead of having one default rule as to 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 tailored, and at least from an economics point of view they should be tailored until the point where additional tailoring is not cost justified.[30] We discuss this issue below in more detail.[31]

2. Personalized Majoritarian Default Rules

Tailoring default rules is often done for different types of transactions, or for different contexts (even for the same type of transaction). But as far as we can tell, it is not done for the personal characteristics of the parties.[32] 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 wheelchair-using consumers, who can be identified easily as such, typically would be delivery at the buyer's place, since such delivery would reduce the parties' total costs, and be preferred by them.[33]

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[29] Anthony Kronman, *Specific Performance*, 45 U. CHI. L. REV. 351, 355-6 (1978) (stating that courts typically grant specific performance in contracts for the sale of a "unique" item, such as the sale of land, antiques, patent rights, etc.); Alan Schwartz, *The Case for Specific Performance*, 89 YALE L. J. 271, 272-4 (1979) (same).

[30] Ayres, *supra* note 6, at 7-9 (arguing that since more tailoring creates complexity and uncertainty, the decision maker needs to tailor the rule up to the point where these costs outweigh the reduction in transaction costs).

[31] *Infra* Part III.C.

[32] In the U.C.C there is a distinction between merchants and non-merchants (U.C.C. § 2-104(1) (2005) defines a merchant), and some of the Code's terms offer customized rules for merchants. *See, e.g.*, U.C.C. § 2-314 (2005) (imposing higher warranty standards by default on merchant sales). Some commentators have raised the argument for having different rules of interpretation for sophisticated and non-sophisticated 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).

[33] *See* Cari Shields, et al. v. Walt Disney Parks and Resorts us, Inc., et al., 279 F.R.D. 529 (U.S. Dist. 2011). In a motion for class certification, plaintiffs, all visually impaired visitors of the Disney resorts in California, allege that defendants discriminated against them. One of the arguments was that the audio description devices provided by the defendant are designed to shut-off automatically after a given time, and cannot be reset by visually impaired users. The court analyzed this argument in terms of design defect. One could argue

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 the buyer (or seller) should be able to opt out of the personalized default rule if so he wishes. But as long as no one opts out, delivery at the buyer's place, in example 1, could be a better default rule than the one commonly applied to buyers who are not disabled.[34] Now consider a more complicated example.

> *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 that into account in choosing the appropriate remedy. We argue that under the assumption that the characteristics of the parties are verifiable by John and the courts, 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

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that the automatic shut-down is preferable for most users, thus making it the majoritarian default rule, while plaintiffs are seeking to impose on defendant personalized default rule for visually impaired visitors.

[34] Business practices in American grocery stores track this default to some extent. A grocery bagger is likely to ask an elderly customer with a large order whether she would like assistance unloading groceries into her car, but probably will not bother asking a twenty-year old who has purchased a box of corn flakes and a magazine the same question.

Default Rule."[35] 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 whom has private information that the other party does not have, in order to incentivize the former to reveal that information to the latter, thereby facilitating an efficient contract.[36]

An example of a penalty default rule used by Ayres and Gertner was the foreseeability requirement, set up in *Hadley v. Baxendale*.[37] Under this requirement, the aggrieved party is entitled to compensation only 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. The foreseeability limitation penalizes an aggrieved party that hides the information by barring recovery for his unforeseeable losses in case of a breach.[38] 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.[39]

Several commentators criticized Ayres and Gertner penalty default rules theory from several angles. It was argued that a penalty default rule, as described by Ayres and Gertner, would not necessarily force revelation of private information by a contracting party, because the revelation might directly contradict bargaining strategies,[40] or because the party with the private information might benefit from being pooled together with other

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[35] Ayres & Gertner, *supra* note 16, at 91 ("Penalty defaults are defaults which 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.")

[36] In 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, courts would not fill in the gap in it and the contract will not be enforced. Ayres & Gertner, *supra* note 16, at 95-96, note 43.

[37] Hadley v. Baxendale, 156 Eng. Rep. 145 (1854).

[38] Ayres & Gertner, *supra* note 16, at 101-4 (arguing that the decision in *Hadley* is an example of a penalty default rule).

[39] *See* Thomas Ulen, *The Efficiency of Specific Performance: Toward a Unified Theory of Contract Remedies*, 83 MICH. L. REV. 341 (1984) (describing the various stages where the promisor takes decisions and incentives matter); Richard Craswell, *Contract Remedies, Renegotiation, and the Theory of Efficient Breach*, 61 S. CAL. L. REV. (1988) 629 (same).

[40] Jason Scott Johnston, *Strategic Bargaining and the Economic Theory of Contract Default Rules*, 100 YALE L. J. 616 (1991) (arguing that the *Hadley* default penalty rule will not incentivize promisees to reveal private information, since the revelation of the value the promisee ascribes to the contract to the promisor, would allow the promisor to raise the contract price substantially).

parties, thereby externalizing costs to them.[41] Eric Posner prominently argued that there are no penalty default rules in contract law, nor should there be any. The reason is that both majoritarian default rules and penalty default rules force contracting parties with private information, which 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. 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 to opt out, but this is an unlikely scenario. [42]

We might better understand a penalty default rule as a species of minoritarian default rule, as Ayres and Gertner acknowledged in an essay they published a decade after they first proposed the penalty default rule idea.[43] We believe that at least as personalized default rules are concerned, there could be penalty default rules, or more accurately, minoritarian default rules, as we explain below. We do suspect, however, that the rise of Big Data (described in Part II) will make penalty default rules decreasingly important, since firms are gaining access to a treasure trove of information about individual consumers.

2. Minoritarian Default Rules as Facilitators of Personalized Default Rules

Minoritarian default rules could facilitate personalized majoritarian default rules. Here's how. If sellers and courts have full information about buyers, default rules aimed at forcing buyers to reveal private information will be meaningless. Sellers and courts, however, often do not have full information about buyers' preferences, characteristics, and traits, and tailoring default rules *personally* for them seems to be impractical. A default rule could provide incentives for buyers 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 convey

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[41] Barry E. Adler, *The Questionable Ascent of Hadley v. Baxendale*, 51 STAN. L. REV. 1547 (1999) (arguing that parties with private information would not reveal their types when they enjoy from the cross-subsidization entailed by pooling them with other parties).

[42] *See* Eric Posner, *There Are No Penalty Default Rules in Contract Law*, 33 FLORIDA STATE U. L. REV. 563 (2006) (arguing that examples of penalty default rules are either not default rules at all, or can be explained by the majoritarian default rule theory); Lucian A. Bebchuk & Steven Shavell, *Reconsidering Contractual Liability and the Incentive to Reveal Information*, 51 STAN. L. REV. 1615, 1624-6 (assessing the *Hadley* default rule of limited liability, the authors argue that the rule entails some costs in different situations, and should be adopted only in situations where the parties would have most likely wanted it in advance, which makes it a majoritarian default rule); Johnston, *supra* note 40, at 622-3 (arguing that the *Hadley* rule might be preferable by the parties ex-ante, and thus not a penalty rule).

[43] Ayres & Gertner, *supra* note 6, at 1600-02 (explaining that penalty default rule is one type of minoritarian default rule, which is efficient when it is less costly for the majority than the minority to opt out).

such information cheaply but nevertheless failed to do so.

Consider again example 2 (Specific Performance or Damages). Suppose sellers and courts cannot distinguish accurately between Steven and Sarah, and therefore tailoring personalized default rules for them is currently impossible. Nevertheless, a default rule of damages could 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 default 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 preference for damages nor his characteristics and traits, because he is no worse off with specific performance than with a damages remedy. Though he is indifferent between damages and specific performance, he may be better off with specific performance, since that latter remedy would improve his bargaining position vis-à-vis the seller, for whom specific performance is typically more burdensome.[44]

But this analysis is incomplete. If the seller is able to structure the contract so as 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 whose costs of revealing his or her preferences or characteristics are lower: Steven or Sarah's? 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. Even if there are more "Stevens" than "Sarahs" among buyers, but it is much less costly for "Stevens" than for "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 affect the contents of a set of default rules applied to them. That information could often be private and

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[44] Schwartz, *supra* note 29, 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); Craswell, *supra* note 39, at 636-40 (same).

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 for them to reveal private information about their preferences, and those parties could be the minority. Here a minoritarian default rule could similarly work better than a majoritarian one.

D. Third Party Effects

Under a third approach to determining the content of default rules, default rules should maximize social welfare in general, not necessarily 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."[45] This chapter, however, is not about default rules, but instead about mandatory, immutable rules: naturally, the parties are not allowed to opt out of those rules. Contract law doctrines, however, only rarely take positive effects on third parties into account,[46] and externalizing benefit default rules are rare.[47]

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.[48] Assuming the social goal is to find an optimum between fulfilling people's wishes and third parties' benefits (if those benefits were the only issue, a mandatory rule of donation would be the optimal solution,[49]) 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

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[45] RESTATEMENT (SECOND) OF CONTRACTS § 178-199 (1981).

[46] *See e.g.*, RESTATEMENT (SECOND) OF CONTRACTS § 207 (1981), according to which "[i]n choosing among the reasonable meanings of a promise… a meaning that serves the public interest is generally preferred." *See also* Eyal Zamir, *The Inverted Hierarchy of Contract Interpretation and Supplementation*, 97 COLUM. L. REV. 1710, 1723-4 (1997) (discussing the aforementioned interpretation rule).

[47] See Ayres & Gertner, *supra* note 6, at 1598-90 (discussing default rules which create positive externalities).

[48] Sunstein, *supra* note 5, at 1-2.

[49] *See* Lior Jacob Strahilevitz, *The Right to Destroy*, 114 YALE L.J. 781, 807-08 (2005).

expected to object to organs' donations, and would opt out of any default rule that allows it,[50] a no-donation default rule is the desirable one for them, since it would save transaction costs of opting out. If instead there are other groups in society that might oppose donation weakly but would not incur the costs of opting out, applying a default rule that is not majoritarian but balances possible donors' weak preferences against the strong preferences of people on transplant waiting lists could better achieve the social goal. Indeed, personalizing rules may dampen political opposition to the implementation of default rules that produce positive externalities by "buying off" the interest groups that are most likely to oppose a default rule that benefits third parties.

II. THE FEASIBILITY OF PERSONALIZED DEFAULT RULES

Part I showed how majoritarian and penalty default rules might be personalized. The discussion so far implicitly has contemplated two different sorts of personalized default rules. One 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.[51] Gender is easily observable, so the costs of determining which set of intestacy rules apply will be low. We can refer to similar approaches 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 multitudes of possible personalized default rules. Nevertheless, regularities exist, and the task of using those regularities to establish sufficiently large groups of like-minded individuals who can be assigned the same set of default rules confronts a tradeoff between precision and complexity.[52] 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

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[50] *See* Robert Steinbuch, *Kidneys, Cash, and Kashrut: A Legal, Economic, and Religious Analysis of Selling Kidneys*, 45 HOU. L. REV. 1529, 1566 n. 268 (2009).

[51] Assume for present purposes that such classifications are legally permissible. That assumption may be an unreasonable one. We discuss the issue further *infra* Section III.D.

[52] *See infra* Part III.C.

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 those granular defaults.

A. Big Data and Big Five

An apparent hurdle in creating personalized default rules is the issue of convenient identification of 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. To take our Example 2, both Steven and Sarah will argue that they are the types of people entitled to specific performance if that remedy creates an entitlement that strengthens their bargaining position relative to John.[53] Is there a reliable way to prevent these problems of proof? We believe that in the era of Big Data the answer to that 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 individuals' future behavior.[54] 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 is estimated to grow to $34 billion in 2013.[55] To put that $28 billion number in perspective, it is an amount equal to the annual Gross Domestic Product of Jordan or Latvia.[56] Yet with greater growth potential.

What are these 28 billion dollars purchasing? 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, the news media has reported on applications of Big Data to a dizzying array of industries. Facebook's new "social graphs" search feature seeks to employ that company's Big Database to better predict which search results will be most useful to individuals who type in search queries.[57] Big Data is a big industry in higher education.[58] Big Data

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[53] *See supra* Part I.B.2. and text accompanying note 44.

[54] Lior Jacob Strahilevitz, *Toward a Positive Theory of Privacy Law*, 126 HARV. L. REV. ___ (forthcoming 2013).

[55] Nick Kolakowski, *Big Data Spending Will Hit 28 Billion in 2012*, Slashdot, available at http://slashdot.org/topic/bi/big-data-spending-will-hit-28-billion-in-2012-gartner/.

[56] *See* http://www.tradingeconomics.com/country-list/gdp

[57] Somini Sengupta & Claire Cain Miller, *Search Option from Facebook is a Privacy Test*, N.Y. Times, Jan. 18, 2013, at A1.

[58] Marc Perry, *Big Data on Campus*, N.Y. Times, July 18, 2012, at ED24.

is a big business in medicine.[59] It is all the rage in insurance.[60] Researchers have shown how by analyzing on-line behavior they can predict an individual's race,[61] and how by monitoring an individual's television viewing habits, they can make accurate predictions about her ideology.[62] 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.[63] These technologies have been employed to help businesses find customers who will be profitable, patients who will need special care, voters who are persuadable, and insureds who present good risks.[64]

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, so that they will remember whether particular patrons prefer black or white napkins, and red or white wine.[65] This information can then be shared with partner restaurants via Opentable.com's reservation database.[66] 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 forthcoming article by Daniel Katz.[67] Katz identifies

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[59] Derrick Harris, *Better Medicine, Brought to You by Big Data*, GigaOM, July 15, 2012, available at <http://gigaom.com/cloud/better-medicine-brought-to-you-by-big-data/?utm_source=social&utm_medium=twitter&utm_campaign=gigaom>.

[60] Laurie Sullivan, *Credit Ratings Aid Marketers in Targeting Ads*, Aug. 20, 2012, Media Post News available at <http://www.mediapost.com/publications/article/181075/credit-ratings-aid-marketers-in-targeting-ads.html#axzz2F2rHWmiH>.

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

[62] Bill Carter, *Republicans Like Golf, Democrats Prefer Cartoons, TV Research Suggests*, N.Y. Times Media Decoder, Oct. 11, 2012, available at <http://mediadecoder.blogs.nytimes.com/2012/10/11/republicans-like-golf-democrats-prefer-cartoons-tv-research-suggests/?smid=tw-nytimes>.

[63] *Obama Campaign's Voter Data Crunching Paid Off*, L.A. Times, Nov. 13, 2012.

[64] Natasha Singer, *Secret E-Scores Chart Consumer Buying Power*, N.Y. Times, Aug. 18, 2012, at BU1 (profiling eBureau, a technology company that uses data mining to determine which individuals are likely to be profitable customers for firms).

[65] Susanne Craig, *Getting to Know You*, N.Y. Times, Sep. 5, 2012, at D1.

[66] *Id*.

[67] *See, e.g.*, 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. __ (forthcoming 2013), available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2187752>.

numerous 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.[68] 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 make use of 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 it a few more words on Big Data and Big Five are in order.

Journalists writing about Big Data have spilled much more ink discussing the fact of Big Data's proliferation than what makes it efficacious. 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 reveals fundamental aspects of individuals' personalities and values.[69]

Psychologists understand human behavior largely in terms of the "Big Five" personality characteristics: Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness.[70] An enormous psychological literature has identified ways in which particular personality traits are more pronounced among people who engage in particular sorts of behaviors.[71] For example, people who score highly on extraversion are more likely to disclose information about themselves on social networks,[72] people who score highly on conscientiousness are more likely to be

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[68] *Id*.

[69] Strahilevitz, *supra* note 54, at __.

[70] Murray R. Barrick & Michael K. Mount, *The Big Five Personality Dimensions and Job Performance: A Meta-Analysis*, 44 PERSONNEL PSYCH. 1, 3-5 (1991).

[71] The legal literature employing "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 L. & PSYCH. 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 L. & HUMAN BEHAV. 118 (2010).

[72] Baiyun Chen & Justin Marcus, *Students' Self-Presentation on Facebook: An Examination of Personality and Self-Construal Factors*, 28 COMPUTERS IN HUMAN BEHAV. 2091, 2097 (2012); Traci Ryan & Sophia Xenos, *Who Uses Facebook? An Investigation into the Relationship Between the Big Five, Shyness, Narcissism, Loneliness, and Facebook Usage*, 27 COMPUTERS IN HUMAN BEHAV. 1658, 1662 (2011).

politically conservative,[73] and Americans score noticeably higher on personality tests measuring agreeableness than do Western Europeans.[74] By employing Big Data, firms have found a substitute for administering complex personality tests to all potential customers so that they can identify everyone's quirks and predilections.[75] 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 is being studied. Moreover, because they will be studying a consumers' revealed preferences, rather than her responses to surveys (which might be slanted in ways the consumer believes will benefit her), firms may justifiably view the results of these quasi-personality tests as particularly reliable metrics. We are not suggesting that the Big Five research unlocks every behavioral mystery – the extant data suggests otherwise[76] – but it surely identifies numerous powerful tendencies among individuals and groups.

A fascinating new article by Gokul Chittaranjan, Jan Bloom, and Daniel Gatica-Perez shows the promise and potential of using data mining to identify individuals' personality profiles.[77] These three scholars administered personality tests to scores of Swiss smartphone users and then monitored the users' smartphone activity over the next 17 months. They found numerous significant correlations between particular personality traits and observed smartphone behavior. If you have someone's cell phone and you know what to look for, you know a lot about what makes them tick. Along the way they showed that as a practical matter it is straightforward to analyze smartphone usage data automatically so as to predict the personalities of individual phone users. They 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 women was associated with an increase in the number of incoming calls. Agreeable men were found to communicate with more number of

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[73] Dana R. Carney et al., *The Secret Lives of Liberals and Conservatives: Personality Profiles, Interaction Styles, and the Things They Leave Behind*, 29 POLITICAL PSYCH. 807, 824 (2008).

[74] David P. Schmitt et al., *The Geographic Distribution of Big Five Personality Traits*, 38 J. CROSS-CULTURAL PSYCH. 173, 185 tbl. 2 (2007).

[75] Strahilevitz, *supra* note 54, at __.

[76] *See, e.g.*, Stevenson & Caldwell, *supra* note 71, at 110-11.

[77] Gokul Chittaranjan et al., *Mining Large-Scale Smartphone Data for Personality Studies*, 15 PERSONAL UBIQUITOUS COMPUTING 1 (December 2011).

> unique contacts through voice calls. On the other hand, conscientiousness was associated with higher usage of the Mail app, which 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 stability was linked to higher incoming SMS. And high openness was associated with increased usage of Video / Audio / Music apps in women and also with the usage of nonstandard calling profiles such as *Beep* and *Ascending* in the entire population.

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 the character of their customers. Yet their research has been completely ignored by legal scholars. A follow-up Big Data project, in which a team of researchers from MIT and the University of Trento analyzed social network ties and personalities of cell phone users, suggests that in many respects behavioral data from smart-phones can better predict individuals' personalities than personality surveys themselves.[78] This hot-of-the-presses research confirms that behavioral data can predict personality, and we already know from a vast psychology literature that personality can predict behavior. The iPhones, not the eyes, turn out to be windows into the soul. *That* is why Big Data is already a $28 billion industry.

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.[79] Through analytics, Target realized that multivitamin and lotion purchases were an early warning indicator about a biological change that was happening in pregnant women's bodies, which the women might otherwise be reluctant to reveal to Target. Target used this information to its advantage, since its marketing psychologists understood that the birth of a new child is a life-changing event that disrupts existing purchasing patterns. If Target could make new moms into loyal customers, there was a greater chance that they could keep them as customers in the years and decades that followed.[80]

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[78] Jacopo Staiano et al., *Friends Don't Lie – Inferring Personality Traits from Social Network Structure*, 16 UBIQUITOUS PERSONAL COMPUTING 1 (Sep 2012) ("[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.").

[79] Charles Duhigg, *How Companies Learn Your Secrets*, N.Y. Times, Feb. 19, 2012, at MM30.

[80] *Id.*

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, voting behavior, borrowing activity, and social network composition reveals aspects of that individual's personality and preferences. Of course, it is one thing for firms to employ analytics at a high level and another matter entirely to think that lawyers or judges can duplicate the processes that were employed at a high level by Fortune 500 companies and successful presidential reelection campaigns. The institutional competence concerns are legitimate, especially at the present, when courts have developed no expertise in profiling and Big Data generally. Nevertheless, we submit that in conjunction with social science research and an adversarial system whereby litigants' counsel educate judges and juries, Big Data techniques already can generate a set of crude personalized default rules to resolve matters that are frequently the subject of litigation. We would envision psychological evidence coming before the court via expert testimony, so it would of course be subject to *Daubert*[81] and the rules that generally govern evidence admissibility, with liberal use of *in camera* proceedings where proprietary algorithms need to be evaluated. As the science advances, we believe that skilled legal counsel and these expert witnesses can help the law shift towards increasingly granular personalized default rules. The legally relevant question would be the parties' characteristics and traits at the time the contract was entered into (or, in the case of probate matters, at the decedent's death), as well as past behavior of the parties involved. In our world of Big Data and nearly infinite storage capacity, this sort of information should be readily accessible.

Because personalized, Big Data-driven default rules can work in litigation, they should be predictable by the parties when creating their rights and duties, and prove useful to parties seeking to settle their disputes in the shadow of the law. Firms are already accessing and analyzing the profiles of individual consumers for marketing, pricing, and quality assurance purposes anyway, and the individual consumer usually knows her own true preferences and characteristics reasonably well. It is therefore plausible that parties would be able to verify the content of the default rules applied to them,[82] and if there are disputes, many of them could settle without the need for experts to be hired and summary judgment motions to be resolved. We have already shown how Big Data and personalization could change the law of inheritance.[83] Let us now consider other important applications.

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[81] Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579, 113 S.Ct.2786 (U.S. 1993)

[82] For the "uncertainty" problem, see *infra* Section III.C.

[83] *See supra* text accompanying notes 1-4.

1. Consumer Contracts

The most natural field to apply the personalized default rules approach is consumer law. As we have explained, firms have an increasingly enormous amount of data on consumers' preferences and characteristics. This data can be used to tailor different default rules for their contracts. This same data can be utilized by the parties to settle disputes in the shadow of the law, as well as by the courts. 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.

Consider Example 1 (Place of Delivery) first, 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 no need for much 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 interpretation techniques.

In some industries, a default rule of "delivery at the buyer's residence" could be an efficient minoritarian default rule, which would facilitate personalized default rules. Thus, a store selling medical equipment, might have a relatively high number – but still 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 non-disabled consumers to ask for delivery at the seller's place, with a possible price discount.

2. Medical Malpractice

The personalized default approach could 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 cases (say, one in every 500,000 cases). The drug is most effective when taken for a prolonged period of time, but still somewhat effective when taken for just a week or two. The doctor fails to warn the patient about this particular side effect. A patient suffers the rare side 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, present law treats this inquiry as an objective one: What would a reasonably prudent patient have done?[84]

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[84] *See, e.g.*, Canesi ex rel. Canesi v. Wilson, 730 A.2d 805, 812-18 (N.J. 1999).

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. She will then be judged based on whether her disclosure was appropriate for a particular patient type (not 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, with the firm having launched FICO Adherence Scoring recently. FICO adherence scores use information from a patient's credit report to predict the likelihood that a patient will regularly take his prescription medication and otherwise adhere to medical advice.[85] 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.[86] On our analysis, a default rule of non-disclosure would be appropriate *for this particular patient*.

At the same time, if the same doctor was 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, and those 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.[87]

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 things that credit scoring can do is 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.[88] Suppose that a plaintiff's consumer behavior profile

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[85] http://www.creditcards.com/credit-card-news/fico-score-medication-adherence-1270.php

[86] Gil Seigal 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).

[87] *See* Gary E. Marchant, *Foreword*, 48 JURIMETRICS J. 131 (2008) (introducing a symposium on the law of personalized medicine).

[88] Edward R. Morrison & Arpit Gupta, Health Shocks and Household Financial Fragility: Evidence from Automobile Crashes and Consumer Bankruptcy Filings (unpublished draft, Dec. 10, 2012).

reveals her to be an extremely cautious person. In that case the law might impose heightened disclosure requirements on the physician. If the patient's profile reveals her to be 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 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 such 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 such an outcome was extremely remote.[89]

The (hopefully rare) patient who is misunderstood by FICO or other providers of analytics, 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."[90] 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. To avoid such free-riding a mandatory law could force vaccination. A softer approach would be to have an impersonal default rule according to which doctors could say nothing about side effects, unless asked, and go forward with vaccination, unless told otherwise. A still better approach in a world where, say, 80-90% vaccination suffices to confer herd immunity and 10% of the population are 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 patients who have suffered side effects in FDA trials.

3. Landlord-Tenant Law

We believe that personalized default rules are appropriate in

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[89] *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).

[90] For a further discussion of the benefits and perils of such discussion, see *infra* text accompanying notes 176-180.

adjudication of 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 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, causing it to be an unsafe space for sleeping, though 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 need not pay further rent? In most American jurisdictions, the answer to that question would be yes. The condition of the ceiling constitutes a breach of the implied warranty of habitability, which is read into every landlord-tenant contract.[91] But some jurisdictions treat the implied warranty of habitability as a default provision that the parties can waive via explicit contract terms.[92]

American law has largely stuck with a one-size fits all approach to the implied warranty of habitability, though 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 implied warranty of habitability when the tenant rents a single family home (as opposed to a unit in a multi-unit building,)[93] and other jurisdictions hold that there is nothing akin to an implied warranty of habitability when non-residential properties are leased.[94] This granularity of the rules is based on suppositions by common law courts that particular variables governing property ought to affect the tenant's substantive legal rights.[95]

Our approach to personalized default rules posits that the characteristics of the tenant (and landlord) may be as relevant to determining the appropriate missing term to impose on the contract, particularly when the landlord has access to the information relating to the tenant's past behavior, characteristics, and traits, or to data indicating what are the suitable default rules for the tenant. Is the tenant an individual who routinely bargain hunts, and is willing to sacrifice quality in return for cost savings? If so, the court plausibly ought to view the lease as lacking an implied warranty of habitability. Is the tenant someone who regularly stays

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[91] See, e.g., Hilder v. St. Peter, 478 A.2d 202 (Vt. 1984).

[92] *See, e.g.*, P.H. Investment v. Oliver, 818 P.2d 1018, 1021-22 (Utah 1991).

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

[94] *See, e.g.* K & S Enterprises v. Kennedy Office Supply Co., 520 S.E.2d. 122, 126 (N.C. App. 1999).

[95] Note the similarities to the U.C.C.'s treatment of unique and non-unique goods. *See supra* text accompanying note 29.

in nice hotels, pays for weekly maid service, and otherwise indicates a propensity for paying for comfort and pleasing aesthetics? If so, the court plausibly 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 highly emotionally stable person who may be annoyed but won't be made anxious by her substandard ceiling?

We are not suggesting that these intuitive correlations among purchasing history, personality, and expectations for an apartment are air-tight. We are articulating falsifiable hypotheses that ought to be tested empirically. But 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 since at least the mid-1990s.[96]

4. Labor Law

American labor law is not often thought of in terms of default rules, but defaults are very important in that field. More precisely, the default provision under the National Labor Relations Act is that workers are not unionized. If a group of workers mounts a unionization drive and a majority of the workers (or, in some cases, a majority of a subset of the non-management 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 as a whole.[97] Union certification efforts can be cumbersome, expensive, and contentious. At the same time, it seems plausible that the default rule American law has chosen is an appropriate one on majoritarian grounds – most American workers are non-unionized and have chosen to be non-unionized for quite some time.[98]

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 those two traits predicts union membership very strongly.[99] Big Five personality characteristics also predict which industries individuals are likely to be drawn to, and which

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[96] Dwyer v. American Express Co., 652 N.E.2d 1351, 1353 (Ill. App. 1995).

[97] *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, 1128-40 (2011).

[98] An important caveat is in order. We do not know what the preferences of workers would be with regard to unionization in an environment where the transaction costs of forming a union were zero, and some workers' decisions not to be part of a union may result from coercion of collective action problems.

[99] K.R. Parkes & T.B.D. Razavi, *Personality and Attitudinal Variables as Predictors of Voluntary Union Membership*, 37 PERSONALITY & INDIVIDUAL DIFFERENCES 333, 333 (2004).

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, though nurses with high levels of Extraversion are likely to avoid burnout.[100] While politicians score very high on Extraversion and Openness, bureaucrats in the same jurisdictions do not.[101] Managers and sales representatives show high levels of Extraversion,[102] and high levels of Neuroticism appear to be common among the unemployed.[103]

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.[104] Given the underrepresentation of highly neurotic individuals in the workforce, the non-unionized default plausibly makes sense for most workplaces.

At this point we want to identify this kind of workplace profiling to determine the default rule as a theoretical possibility, rather than something we are advocating. Correlations and causation are distinct, and the factors that drive union membership continue to be debated.[105] 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 participation in a union makes workers more extroverted 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 pro-unionization default rule could be appropriate in some contexts.

C. Big Data Guinea Pigs

Countries with enormous populations ought to take advantage of

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[100] Kelly L. Zellars, *Burnout in Health Care: The Role of the Five Factors of Personality*, 30 J. APPLIED SOC. PSYCH. 1570, 1588-89 (2000).

[101] Michael Ashton et al., *Personality Traits of Municipal Politicians and Staff*, 50 CANADIAN PUB. ADMIN. 273, 285 (2007).

[102] Barrick & Mount, *supra* note 70, at 19.

[103] *Id*. at 20.

[104] We assume away 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. L. REV. 445, 446-49 (2008) (reviewing comparative data on competition among unions); Ann C. Hodges, *Southern Solutions for Wisconsin Woes*, 43 U. TOLEDO L. REV. 633, 647 (2012) (discussing informal non-competition arrangements among unions in Virginia).

[105] An introductory analysis of these questions is offered in Nicola-Maria Riley, *Determinants of Union Membership: A Review*, 11 LABOUR 265 (2003).

economies of scale. In this case that means foregoing the need to carefully monitor the choices of all their citizens, and perhaps sidestepping some of the problems from inefficient social norms in the process. We therefore propose that American law ask one million residents to make active choices about their preferences, provide modest compensation to these guinea pigs for the transaction costs they have incurred, and then data mine to identify ways in which the 314 million individual Americans are similar to any of the 1 million guinea pigs.[106] The guinea pigs' active choices would become the personalized default choices for the people most similar to them across a variety of observable metrics. These surveys could be conducted via a government agency, like the Census Bureau or United States Consumer Financial Protection Bureau, or an industry consortium.

A great deal of contract law scholarship worries about the extent to which consumers are rushed or inattentive and pay little attention to contract terms as a result.[107] Yet if one in every 314 people is a compensated contract law guinea pig,[108] then the law might reasonably devote substantial resources to making sure that those guinea pigs are very well-informed and have adequate time to consider the contractual options and associated tradeoffs. They can spend time reading the fine print so we don't have to. And once we have a large dataset tracking the choices of these guinea pigs, we can identify behavioral patterns and give each consumer contractual terms that mimic those chosen by the guinea pigs with the personalities and attributes most similar to hers. Only the choices made by the guinea pigs prior to the time the contract at issue was executed would matter.

Our "sampling" strategy mirrors the sorts of extrapolations used routinely by demographers and survey researchers.[109] Such strategies are already used for predictive purposes in the private sector. 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 against the ratings of other users in the Netflix database, and (c) uses these similarity scores to predict how well users will like particular movies, so that users can employ these predictions in

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[106] *See infra* Section III.C.

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

[108] 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.

[109] The closest analog in existing legal scholarship for the guinea pigs proposal would be the sort of legal experimentation proposed in Michael Abramowicz et al., *Randomizing Law*, 159 U. PENN. L. REV. 929 (2011) (proposing randomized trials to test the efficacy of laws and regulations).

deciding whether they ought to rent or download a movie.[110] The more films a user rates, the better the algorithm can personalize that user's movie recommendations and the recommendations of similar Netflix customers.

Of course, rating each movie you have watched on Netflix entails an active choice. Many users of Netflix do not bother to evaluate movies they have seen, perhaps because it takes time to do so.[111] And many Netflix users similarly do not use the "taste preferences" features on Netflix, which permit users to specify how often they watch movies that can be characterized as "absurd," "bawdy," "cerebral," "dark", etc.[112] 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 the need for a 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 guinea pigs would be to generate information necessary for personalizing default rules by asking individuals about their general preferences, characteristics and traits, 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 all the 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.

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, so that they can decide on pricing and service quality, pinpoint potentially fraudulent transactions, and evaluate the effectiveness of their marketing strategies.[113] 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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[110] Clive Thompson, *If You Liked This, You're Sure to Love That*, N.Y. Times Magazine, Nov. 23, 2008.

[111] Another reason why they might not rate movies is that they don't think how well they liked 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 sharing via forced choices, as in Netflix.

[112] See <http://dvd.netflix.com/TastePreferences>.

[113] *See, e.g.*, Duhigg, *supra* note 79.

Consumers are less likely to have this sort of information about individual firms' propensities, though 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.[114]

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, conceding that some of them warrant limits on the appropriate scope for personalized default rules.

A. Cross Subsidies

An obvious objection to our proposal relates to the equities of cross-subsidization. In our analysis, two consumers might buy the same product for the same price and, ex post, receive a different set of contractual rights as part of that transaction. In such circumstances it is tempting to critique our proposal by emphasizing the cross-subsidy from the buyer who receives less generous contractual terms to the buyer who receives more generous contractual terms. 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, quite impulsive, and is easily excited. 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 at the same store a new flat-screen television. After a day of use they 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"[115] or "no right to return," it would be applied equally to Dana and Jim. If, however, personalized default rules are permitted and

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[114] For further thoughts on this point, see *infra* Section III.C.

[115] In New-York, unless the retailer opts-out by displaying "return and refund policy," the default rule states a right to return for cash up to thirty days. *See* N.Y. Gen. Bus. § 218-a*; see also*, Cal. Civ. Code § 1723 (applying the same default as in New York).

feasible, it might be the case that only Dana should be entitled to return the product and get her money back, while Jim would not be allowed to do so. The reason is simple: if Dana and Jim had separately negotiated the right to return with the seller, the outcome would probably be different in the two cases; while Dana might have preferred to have that right, Jim might have preferred not to have it.

At first glance this might seem odd: Jim appears to need the right to return more than Dana. But that "urgent" need is contingent on the current default rule under which both Dana and Jim are entitled to the right to return, and pay the same premium – through the contract price – for having that right. Under the current default rule, careful Dana subsidizes hasty Jim. This is so because Dana rarely uses her right to return while Jim uses it very often, but they pay the same premium. If instead, only Dana would be entitled to use that right, since she uses it very rarely, the cross-subsidization would be diminished. Indeed, the cross-subsidization would disappear if the contract price – or other terms in the contracts – reflected the value of the right to return to the specific buyer.

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 searches for, the company he keeps, and various other aspects of an individual's 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 to whom he will be compared. In effect, the consumer trades in the default rules selected by the guinea pigs who behaved similarly to him at an earlier date for the default rules selected by the guinea pigs who behaved similarly to the "new him." Given this possibility, there is a danger that individual consumers will engage in strategic behavior, so that they are compared to the guinea pigs who have selected the most generous default terms.

To take a salient example of this, 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 good credit risks.[116] Evidently, people concerned about the dangers of carbon monoxide or preventing scratches on hard wood floors are extremely careful, conscientious individuals with low discount rates; precisely the sort of people likely to pay back loans on time.[117] Before it publicized this finding, the credit card issuer could use

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[116] Charles Duhigg, *What Does Your Credit-Card Issuer Know About You?*, N.Y. Times, May 12, 2009, at MM40.

[117] *Id.*

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 mortgages loans. It would be in everyone's interests to stock up on these household products a few months before seeking to purchase a home, even if they had no intention of putting these items to their ordinary use. The strategic purchase of these felt pads and carbon monoxide detectors would therefore function as a smoke screen.[118]

Although the problem of strategic behavior is always an issue, we do not think it is a particularly troublesome one 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 publicly disclose 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 smokescreens is costly. If people regularly purchase products they don't need, become Facebook friends with people they don't like, or develop hobbies they don't enjoy so as 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 to just specify a different contractual term at the time a contract is entered into, or pay a higher price, rather than putting on an elaborate and costly performance to achieve the same result. *Third*, while keeping up a charade may be easy for a short period of time, it gets harder for the consumer (and easier to detect by the seller) with every passing day. Thus, in Example 3 (Right to Return), if hasty Jim pretended to be careful Jim, and got a right to return, after several instances of abusing that right, 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: having a specific character could benefit a consumer in one context but harm him in another context, and on many occasions would bring him a default rule that does not fit him personally.

While we think strategic behavior is a manageable problem associated with personalized default rules, the problem would be magnified if personalization expanded beyond waivable defaults. It is possible that personalized default rules will become so engrained 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 negotiation away from those personalized terms as prohibitive on transaction cost grounds. Such a development, away from personalized default rules and towards unwaivable "personalized terms" strikes us a

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[118] Lior Jacob Strahilevitz, *Signaling Exhaustion and Perfect Exclusion*, 10 J. TELECOMMUNICATIONS & HIGH TECH. L. 321, 327 (2012).

sufficiently thorny topic to warrant an article of its own. We suspect society is unlikely to need to cross that bridge, at least in the immediate future, in part because the strategic behavior problem would be substantially magnified in a world where most terms were non-negotiable.

C. Uncertainty

According to a third objection, adopting a personalized default rules regime increases uncertainty thereby making the law less effective in guiding people's behavior. It may also increase the costs of adjudication.[119] Impersonal default rules avoid these drawbacks.

Uncertainty would be ameliorated by approaches to contract law that lock in the choices made by guinea pigs prior to the contract's execution. Any subsequent shifts in the choices of guinea pigs would be irrelevant to the meaning of a contract. That is the approach we advocate here. Mechanically, a consumer would be entitled to ask at the point of sale what personalized terms are dictated by her consumer profile, and the firm would respond with a disclosure of those terms. Because the entire process would be automated, the production of this information for consumers would not slow down transactions. The consumer's review of default terms might slow down the transaction, but the same is true of existing, written contract terms.

To better understand the uncertainty objection to a personalized default rules regime, reconsider Example 3 (Right to Return). If there is a "one size fits all" default rule, of 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. In the same way, if the choice of remedy is not contingent on the buyers' characteristics and traits, in Example 2 (Damages or Specific Performance), 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 which could be derived from their particular traits. With personalized default rules there is more uncertainty: in the two abovementioned examples, contractual parties would find it harder to contemplate their substantive rights and remedies.[120]

The choice between personalized default rules and impersonal default rules only loosely tracks the choice between rules and standards, which has been thoroughly analyzed by commentators.[121] Most importantly, rules are more costly to create while standards are more costly for individuals to

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[119] Ayres, *supra* note 6, at 13 (discussing the complexity costs of tailoring default rules).

[120] *Cf.* Geis, *supra* note 7, at 1124-29 (discussing transaction costs, and other costs, of tailoring default rules).

[121] *See, e.g.*, Duncan Kennedy, *Form and Substance in Private Law Adjudication*, 89 HARV. L. REV. 1685 (1976) (making first the distinction between rules and standards); 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).

interpret when deciding how to behave and for adjudicator to apply to past behaviors.[122] At first glance an impersonal default rule seems to resemble a rule, while a personalized default rule seems to resemble a standard. Thus, in Examples 3 and 2 which are mentioned above, an impersonal default rule (such as "right to return" or "damages", 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 which are standards (e.g., a duty of good faith) and personalized default rules which are rules (e.g., different intestacy rules for men and women).[123] Therefore, the crucial question with personalized default rules is how to balance uncertainty with accuracy, to better reduce transaction costs, encourage desirable behaviors, and meet people's reasonable expectations.

Would a personalized default rule be typically associated with less certainty than an impersonal default rule? Not necessarily. A consumer living in a world with impersonal default rules needs to invest resources in learning the contents of the default rule (or bear the risks of not doing so). A consumer living in a world with personalized default rules needs to invest resources in learning the content of whichever default rule applies to him, and he may 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 what guinea pigs just like him chose. 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 that there is a greater likelihood he can do so without consulting a lawyer.[124]

A caveat is in order. In our model the guinea pigs will be 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

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[122] Isaac Erlich & 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 121 (comparing rules with standards on various dimensions).

[123] *See* Geis, *supra* note 7, at 116-19 (distinguishing among simple rules, complex rules, simple standards and complex standards).

[124] 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 rules. *See* Geis, *supra* note 7, at 1122-23.

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. That seems likely to be, at worst, a wash. Over time, it is conceivable that many consumers will 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.[125] For those consumers who remain untrusting, 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.[126] Contracting firms may face information asymmetries regarding consumer preferences, but obviously reducing those asymmetries is one of the Big Data industry's chief objectives.

Of course, if judges are not skilled at identifying litigants' characteristics and preferences, then the cognitive loads faced by adjudicators will rise as a result of the shift from impersonal default rules to personalized default rules. And as these cognitive loads rise, the risk of judicial error rises, 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.

Even if personalized default rules invariably enhance uncertainty in litigation because of these dynamics, there are plenty of cases where personalized default rules promote accuracy, with little effect on certainty. For example, in our contemplated scenario of a transaction between a firm and a consumer, the firm knows what terms a particular consumer is entitled to 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. In the event of a subsequent dispute, the court would have as much access to the personalized terms as it would to the written contract, so the uncertainty associated with interpretation would be no greater than normal. Nor is the uncertainty concern a serious one with our inheritance law example and other cases where the default rule is tailored according to a salient and easily observable characteristic such as

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[125] Thompson S.H. Teo, *Attitudes Toward Online Shopping and the Internet*, 21 BEHAVIOUR & INTERNET TECH. 259, 265 (2002) (noting that at that time consumer concerns about the security of financial information used to make purchases over the Internet remained a significant impediment to e-commerce).

[126] *See supra* text accompanying note 114.

sex or age. Where a personalized rule is particular to a defined social group (e.g., a default of no organ donation among Shintos), we can expect that group members will learn the contents of the crude personalized default rule without having to investigate it.[127] That brings us to a closely related objection: caselaw fragmentation, which is our next topic.

D. Caselaw Fragmentation

Impersonal default rules minimize the fragmentation of the case law that resolves contractual ambiguity. That is a key advantage. Personalized default rules, by contrast, would engender greater fragmentation in the legal precedents. That feature is a real drawback associated with personalized default rules, one that may prove decisive in some cases.

Presently, if a court interprets ambiguous contractual language, its interpretation will possess precedential value and help clarify the law in future disputes arising out of ambiguity. The precedential effect is most powerful with respect to 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 same contractual language may be construed to mean different things if the court identifies pertinent differences in the context of the negotiation.[128] Certainly, however, the interpretation of language will play a significant role in mitigating subsequent judicial uncertainty about the language's meaning in future disputes.[129] But 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 similarity in the language at issue the more difficult it will be to do so on contextual or other grounds.

With personalized default rules, distinguishing a precedent a judge does not like becomes easier. 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 might appropriately argue that the litigant in the earlier case and the litigant in the subsequent case have sufficiently different personalities, attributes, and profiles to warrant divergent interpretations of the

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[127] *Supra* text accompanying notes 49-50.

[128] *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.").

[129] *See, e.g.* United States for Use of B's Co. v. Cleveland Electric Co., 373 F.2d 585, 588 (4th Cir. 1967).

ambiguity. No two human beings are identical in every respect, so the court will have to confront the question of whether litigant heterogeneity warrants a different result in the face of linguistic and contextual homogeneity. This fragmentation of precedent seems poised to enhance uncertainty about the law's content. Where this problem is particularly pronounced it warrants skepticism with respect to personalized default rules.

The question is one of tradeoffs, and it is not obvious whether the costs associated with indirect uncertainty and caselaw fragmentation exceed the benefits associated with giving a far greater number of individuals default rules that approximate their preferences more closely than impersonal default rules presently do (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 be employed only to deal with contractual silence, and not to deal 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 differing implications for different parties.

It is worth noting that courts have occasionally confronted this issue of fragmentation before. In one prominent en banc decision, the Federal 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 will destabilize existing contracts.[130] 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 more palatable if undertaken in a rigorous, data-driven, ex ante way, which is our aspiration in advocating personalized default rules.[131] We therefore conclude that uncertainty and precedent fragmentation are important but not inevitably decisive considerations in deciding on the desirability of personalized default rules.

E. Statistics and Stereotyping

A possible objection to our proposal is similar to the one raised against profiling in law enforcement, or more generally, against the usage of statistical data for determining rights and duties. Statistical data does not

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[130] *See, e.g.*, Hall v. Federal Energy Regulatory Comm'n, 691 F.2d 1184, 1194-1195 & n.19 (Fed. Cir. 1983) (en banc).

[131] 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. Pro. 23 (A)(3). As the differences of consumers becomes increasingly regularized, and the law comes to depend on the characteristics of particular consumers much more, the proper scope of class action litigation will come to be diminished substantially.

focus on the individual parties; instead, it purports to establish factual findings, and allocating rights and duties, by using generalizations concerning the group to which the individuals belong, e.g., their sex, age, race, religion, or any other indicator correlated with the missing facts.[132] This may contradict many people's moral intuitions. Furthermore, using statistical data create 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, is statistical in nature, because it ascribes rights and duties to individuals according to averaged preferences of an entire population or a subset of people. Personalized default rules are just a better proxy – based on more accurate statistics – as to the preferences of the specific party.

Therefore, the objection to our proposal is not the usage of statistical data as such – this kind of data should be used anyway with any type of default rules – but instead that it creates stereotypes we may want to avoid. Take the intestacy example: using different default rules for men and women, according to which, when there is no will, most of a mother's estate goes to the children while most of the fathers' estate goes to their spouses could create (or strengthen) a stereotype that mothers care more about their children than fathers. We consider this objection in the next section.

F. Subordination, Adaptive Preferences, and Personalization

Sunstein's paper on default rules provides an arresting example of an American default rule that may be simultaneously anti-majoritarian and constitutionally compelled. Sunstein draws on fascinating work by Liz Emens,[133] which shows that 80-90% of American women change their surnames when they get married, but trivial numbers of men do so.[134] An obvious potential implication of this data is that a personalized default rule is appropriate. Changing one's name is time-consuming,[135] 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 that default upon request.

Sunstein contemplates the possibility of using a personalized

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[132] ALEX STEIN, FOUNDATIONS OF EVIDENCE LAW 206-07 (2005).

[133] Elizabeth F. Emens, *Changing Name Changing: Framing Rules and the Future of Marital Names*, 74 U. CHI. L. REV. 761 (2007).

[134] *Id*. at 785-86; Sunstein, *supra* note 5, at 10.

[135] Emens, *supra* note 133, at 809.

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."[136] While Emens does not deem unconstitutional a waivable default rule presuming women wanted to change their names, she does say that compulsory name changes for women would be unconstitutional,[137] and she makes a persuasive feminist case that state rules increasing the likelihood that women will adopt their husbands' surnames are normatively undesirable.[138] We will explore the descriptive constitutional claim shortly, but let us address the normative issue first.

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.[139] These strike us as good reasons for the law to continue employing an impersonal default rule according to which marriage does not entail a surname change.[140] Many women will continue to change their names, overcoming the stickiness of the law's default term.[141] 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 forego 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[142] and the expressive dimensions of the law.[143] We therefore agree with Emens and Sunstein that a crude personalized default, with gender as the only variable,[144] is normatively unattractive.

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[136] Sunstein, *supra* note 5, at 15.

[137] Emens, *supra* note 133, at 774.

[138] *Id*. at 765, 770-777. One can conceptualize Emens's claim as an argument that the status quo has appropriately adopted an anti-majoritarian, social welfare-maximizing, impersonal default rule, with gender equality playing a decisive role in the social welfare calculus.

[139] *Id*. at 775-776.

[140] Recall, that under the maximizing social welfare default rule theory, societal values should be taken into account.

[141] *Id*. at 813.

[142] *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.").

[143] *See* Richard H. McAdams, *A Focal Point Theory of Expressive Law*, 86 VA. L. REV. 1649 (2000); Sunstein, *supra* note 5, at 8 (discussing the state's implicit endorsement via default rules).

[144] The crude personalized default would be: Men keep their surnames upon marriage and

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 relied, one sees 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 alumni showed that 20% of them kept their surnames, whereas a study of the overall population found only 10% of married women did so, and a more recent study of *New York Times* wedding announcements found that 29% of marrying women whose vows were written up in the paper of record were keeping their surnames.[145] Women with advanced degrees, women who married or became mothers later in life, graduates of elite universities, and women whose husbands have PhDs were more likely to retain their surnames.[146] Daughters of academics were also more likely to retain their surnames.[147]

Interestingly, demographic variables affecting name changes interact in somewhat surprising ways. Education levels were highly predictive of whether Caucasian women would retain their surnames, but going to college had no affect on African American women's choices about keeping their surnames, and African American women generally retain their surnames at significantly higher rates than Caucasian women.[148]

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 husband's surnames 98% of the time, but that African American women who have Masters Degrees in Education, subscribe to the *Vegetarian Times* and *Mother Jones*, and take yoga classes adopt their husband's 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 those characteristics would see their surnames changed upon marriage but these African American women would not? Imagine the data were to show 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?

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women adopt their husbands' surnames upon marriage.

[145] Emens, *supra* note 133, at 786.

[146] *Id*. at 787-88.

[147] *Id*. at 789. We would like to think that this is because academia is such a glorious profession that the offspring of academics want to broadcast their ties to their parents throughout their lives. *Cf. id*. at 794 (noting that celebrities usually keep their surnames after marrying). Alas, this is almost certainly not the case.

[148] *Id*. at 788.

The red tape associated with a name change is non-trivial,[149] 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. Particularly 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's more, the law's discomfort with relying exclusively on problematic classifications like race and gender may become less pronounced if those factors are mixed with a number of non-suspect classifications to generate a default rule.[150]

Even crude, gender-based personalized decision rules may be appropriate when the dangers of reinforcing an inegalitarian gender norm are minor. *Nguyen v. INS* is one of the key precedents governing the law's use of gender proxies. At issue in *Nguyen* was a government policy that imposed greater burdens on those seeking American citizenship who claim to be the children of United States citizens born out of wedlock. Illegitimate children of American 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.[151] Maternity was presumed for mothers.

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 (via a declaration of paternity or 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 assuring that the person claiming citizenship and the American citizen father are indeed biologically related, and, second, the state interest in assuring that the person claiming citizenship has a meaningful relationship with the American citizen parent and, by extension, with the United States.[152] 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

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[149] *Id*. at 817-18.

[150] *Cf.* 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 withstands strict scrutiny).

[151] *Id*. at 62.

[152] *Id*. at 63-67.

> 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.[153]

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 the achievement of important governmental objectives. The court emphasized that "Congress has not erected inordinate and unnecessary hurdles to the conferral of the children of citizen fathers in furthering its important objectives."[154] The burdens placed on an applicant for citizenship and the burdens placed on a woman defaulted into a surname change she wishes to avoid are comparable. The key consideration for the 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"[155] if there is some reason to believe that the preferences in question are adaptive, and were shaped by a history of patriarchy.

In light of *Nguyen*, we do not think it is certain that the implementation of a crude personalized default rule for surname changes upon marriage would be unconstitutional as a positive matter; the question strikes us as 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, a nice advantage of granular personalized default rules, as opposed to crude gender-based distinctions is that it may be easier to achieve doctrinal 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 nicely 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 the state's race and gender discrimination and conclude that such classifications ought to rarely 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.[156] On the other hand, because gender and race can be reliable predictors of current preferences and future behavior, excluding

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[153] *Id*. at 68.

[154] *Id*. at 70-71.

[155] *Id*. at 73.

[156] Sunstein, *supra* note 5, at 2-3.

these variables from an algorithm entirely leaves a great deal of predictive power on the table. It seems plausible that most people would 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, as a result provides them with less accurate default rules. Finally, it is worth underscoring the fragmented nature of the precedents in the gender- and race-discrimination context. The Supreme Court seems to be animated by different concerns in race and gender cases, and antidiscrimination law is far from coherent as a result. While we think *Nguyen*'s defaults are the most closely on point precedent, a comprehensive explanation of the constitutionality of personalized default rules would require a law review article unto itself.

G. Privacy

Information privacy restrictions make it more difficult to generate personalized default rules.[157] Without the ability to track individuals online, access to comprehensive public and private databases, and 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 much harder line on data privacy than their American counterparts,[158] 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,[159] privacy and antidiscrimination,[160] privacy and gender equality,[161] and privacy and innovation.[162] We can understand the privacy and personalization tradeoff in similar terms. One of the unanticipated consequences of aggressive data privacy regulations will be a shift towards impersonal default rules and away from personalized default rules, shifts from granular personalized default rules to crude personalized default rules, and (as we shall see) shifts from personalized disclosure to impersonalized disclosure.

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[157] Sunstein, *supra* note 5, at 23.

[158] Paul Schwartz, *The E.U. – U.S. Privacy Collision*, 126 HARV. L. REV. __ (forthcoming 2013).

[159] *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).

[160] LIOR JACOB STRAHILEVITZ, INFORMATION AND EXCLUSION 127-156 (2011).

[161] *See, e.g.*, Reva B. Siegel, *"The Rule of Love," Wife Beating as Prerogative and Privacy*, 105 YALE L.J. 2117 (1996).

[162] *See, e.g.*, Ethan S. Bernstein, *The Transparency Paradox: A Role for Privacy in Organizational Learning and Operational Control*, 57 ADMIN. SCI. Q. 181 (2012); Julie Cohen, *What Privacy Is For*, 126 HARV. L. REV. ___ (forthcoming 2013).

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 ads 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 elect 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 greater and the threats from sharing are diminished.[163] There is obviously another potential wrinkle here as well. The primary debate over Do Not Track has surrounded 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 pro-tracking default rule embedded in web browsers. 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.[164]

Paradoxically, we believe that one way around the current stalemate may be to use our lack of privacy in order 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 user. Similarly, if a consumer's existing profile reveals little concern for privacy and characteristics similar to those of guinea pigs who decided to enable tracking online, then permitting tracking ought to be the appropriate default option. Such use of personalized defaults is appealing in contexts like online privacy, where defaults appear to be very sticky.[165] Note that although enforcing a Do Not Track rule against firms is costly, enforcing an evidentiary rule limiting the admissibility of information gleaned from tracking to affect the personalized default rule that applies to a particular

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[163] Alan Westin, *"Whatever Works" The American Public's Attitudes Toward Regulation and Self-Regulation on Consumer Privacy Issues*, available at <http://www.ntia.doc.gov/page/chapter-1-theory-markets-and-privacy> (visited October 2, 2012); Price Waterhouse Coopers, The Speed of Life: Consumer Intelligence Series, Consumer Privacy: What Are Consumers Willing to Share? 1-4 (2012). 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. Price Waterhouse Coopers, *supra*, at 8.

[164] Natasha Singer, *Do Not Track? Advertisers Say "Don't Tread on Us,"* N.Y. Times, Oct. 14, 2012, at 3.

[165] The default provisions contained in Gramm-Leach-Bliley concerning the downstream sharing of consumers' financial information are extraordinarily sticky, with only 1 in 200 consumers opting out of the pro-sharing 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).

consumer is straightforward. Familiar problems of adverse selection and unraveling will remain, with bad-credit types and high-privacy-concern types potentially becoming pooled,[166] but that 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.[167]

Two more points about privacy are worth underscoring here. First, our proposal is to use personalized default rules in adjudication. Litigants essentially have no privacy in the United States. Indeed, the lack of privacy protections in American litigation is a common source of strenuous complaints from our European counterparts,[168] and the effort to reconcile, say, European data privacy protections with American civil discovery rules prompts a fair bit of litigation.[169] Pushing the point further, it is plausible that substituting the automated analysis of a litigant's consumption choices for the possibility of intrusive questioning of the litigant in depositions and interrogatories may be a privacy gain, rather than a privacy loss. On the other hand, the greatest impact of our proposal for personalized default rules in adjudication would be its effect on disputes arising in the shadow of the law.[170] In these settings, the shift towards personalization is almost certainly associated with diminished privacy. We are skeptical that the American government will enact meaningful protections for consumer privacy any time soon. To those who view that reality as a dark cloud, our Article suggests a previously unrecognized silver lining.

H. "But I Can Change!"

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. In principle, the default rules could change on a daily or even hourly basis."[171] We are skeptical about the underlying assumptions of this objection. We

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[166] See Scott R. Peppet, *Unraveling Privacy: The Personal Prospectus and the Threat of a Full-Disclosure Future*, 105 NW. U. L. REV. 1153, 1161-82 (2011); Strahilevitz, *supra* note 54, at __.

[167] *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).

[168] James Q. Whitman, *The Two Western Cultures of Privacy: Dignity versus Liberty*, 113 YALE L.J. 1151, 1157 (2004).

[169] Tania Abbas, Note, *U.S. Preservation Requirements and EU Data Protection: Headed for Collision?*, 36 HASTINGS INT'L & COMP. L. REV. 257 (2013).

[170] *See* Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 YALE L.J. 950 (1979).

[171] Sunstein, *supra* note 5, at 23.

think that most choices about default rules are driven by personality characteristics and values, which tend to be rather stable once people reach adulthood. That said, we do 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, or 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 counter-party might agree. Indeed, with the consent of the counterparty, a consumer might specify via 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."

IV. PERSONALIZED DISCLOSURE

The question of default rules has long vexed legal scholars and prompted an enormous academic literature. In recent years, the topic of disclosures has become another hotbed of legal scholarship. In particularly noteworthy recent work, Omri Ben-Shahar and Carl Schneider have argued that disclosure to consumers rarely achieves what its advocates claim, in part because disclosures have a pronounced tendency to grow longer and more complicated over time.[172] 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 disclosure. We have shown earlier how personalization might improve doctor-patient disclosures in the health sector.[173] In this Part we will extend

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[172] Omri Ben-Shahar & Carl E. Schneider, *The Failure of Mandated Disclosure*, 159 UNIV. PA. L. REV. 647, 684-90 (2011).

[173] *See supra* Section II.B.2.

the idea to disclosure more broadly.

Where consumers are purchasing items online, we propose a regime whereby their Big Data profiles help determine which disclosures they see and which disclosures they do not see. The advantages of such a regime are apparent. When online disclosures occur presently, single males who live alone are shown warnings about the effects that prescription medication may have on pregnant women. Childless seniors living in age restricted communities are warned about how household goods may have small parts that can break off and be swallowed by toddlers. Devout, observant Mormons are warned about the effects of mixing a particular pharmaceutical with alcohol. The proliferation of warnings targeted towards a small set of potential consumers lengthens disclosures greatly, heightening 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.[174] Twentieth century disclosure technology involved a printed label with finite space and constraints on how much manufacturers can shrink font sizes to cram more information into those spaces. Twenty-first century disclosure technology ought to take advantage of the fact that most consumers now shop with smart-phones that can scan bar codes.[175] 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 very substantial. Personalizing disclosures will ensure that individuals don't have their time wasted with irrelevant disclosures and don't fail to notice a key disclosure that is buried amidst a plethora of irrelevant disclosures.

As best we can tell, 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 disclosures. The closest proposal in the literature is a recent article by Gil Siegal, Richard Bonnie, and Paul Appelbaum discussing personalized disclosure in medicine.[176] Their version of "personalized disclosure" differs

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[174] A thoughtful article exploring possible uses of these technologies in consumer contracting at the point of sale is Scott R. Peppet, *Freedom of Contract in an Augmented Reality*: *The Case of Consumer Contracts*, 59 UCLA L. REV. 676 (2012).

[175] Kavita Kumar, *Shoppers with Smartphones Put Retailers in Glass Boxes*, St. Louis Post-Dispatch A1 (Feb. 15, 2011).

[176] Seigal et al., *supra* note 86, at 359. Peppet's article has one sentence flagging the

from ours, and we think it lacks some of the advantages of our approach. Their first approach to personalized disclosure acts 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 be of interest to 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; and c) very basic disclosures are made, such as the reasons for the treatment, and the likely period of time the patient will have to miss work.[177] 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."[178]

Siegal and his co-authors also identify a second form of personalized disclosure, one 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.[179] The software would record a transcript of what the patient asked to see and didn't ask to see, and this transcript would be admissible evidence in any subsequent litigation over informed consent.

We think Siegal's proposal is a step in the right direction, but as Big Data proliferates and the sorts of technologies underlying FICO adherence scoring improves, 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 ones 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 guinea pigs very similar to the patient have made with the benefit of full information may be a more sensible way to proceed.[180]

Indeed, guinea pigs might work differently in the personalized disclosure context. We would envision guinea pigs being compensated to read various disclosures and then being asked to evaluate (both immediately and several weeks after the treatment at issue) how useful the disclosed information proved to be. Non-guinea pig patients would then be

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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 174, at 730.

[177] Seigal et al., *supra* note 86, at 361-62.

[178] *Id*. at 362.

[179] *Id*. at 363.

[180] To the extent that a patient or consumers if informed of the right to opt out, this may cause some stress, especially during the transition to personalized disclosure. Decisions to trust guinea pigs will resemble leaps of faith decreasingly as time passes.

matched up with the choices made by the guinea pigs with personalities and attributes most similar to them. The key point is that different warnings will be differentially helpful to different sorts of people. Personalized disclosure thus locates the warnings that were useful to "people like you" or "people like those in your household" and provides you with those warnings, and only 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 have no allergies but who may be bringing in snacks to be shared by a kindergarten class will need to opt into receiving allergen information when circumstances dictate 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 actually read health and safety disclosures carefully.

We anticipate such personalized disclosures are likely to take root in the arena of consumer warnings, but they may spread to other domains as well. For example, a smart-phone application that knows, based on Big Data and guinea pigs, that your are likely to be concerned about particular sorts of risks, can also learn that you are concerned by particular contractual provisions. Most people may not care about the terms of click-wrap software agreements, but some users may be sensitive about particular rights, responsibilities, and waivers. Through automation, an app could do what a good lawyer already does – read the contract in question 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.

There may be a similar role for personalization to play in the context of government disclosures. For example, 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 entails search costs and finding the pertinent information can be difficult. 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.

Finally, we think there is an important role to play for personalized disclosures in personalizing default rules. 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 they are likely to be upset by this level of uncertainty 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 were not unified over which terms were best, the consumer may be presented with active choices among several default terms or instructions as to how the default might be altered.

Whereas the objections to personalizing default rules are many, we think that the objections to personalized disclosure are fewer in number and less significant. As with default rules, an individual could always request disclosure of a greater quantum of information than what personalization suggests, and we would want these choices to be honored. Given that possibility, it is hard to imagine individuals engaging in strategic behavior to affect the disclosures that would be made 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 uncertainty and fragmentation worries. And constitutional objections to personalized disclosure by the government seem unlikely – 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, are 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 low-probability side effect of a drug based on their personality profile, and then, due to some fluke, the low-probability side effect should manifest itself.[181] 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 would-be defendants to fully capture the benefits of non-disclosure resulting from personalization.

To summarize, we think that personalized disclosures may be the

[181] By contrast, we would support legal liability for negligent or reckless profiling that results in harm because an individual was mis-categorized.

wave of the future too. They have the potential to minimize the information overload problem faced by consumers and to prompt consumers to start paying attention to pertinent disclosed information once again. 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 Ian Ayres's essay, published twenty years ago, no one has developed a comprehensive account of personalized default rules. Cass 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 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 particular 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 by 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 demonstrate, the most powerful critiques that have been launched 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 the 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 better be achieved with personalized default 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 first done into 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 raise the argument 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 using constitutional provisions developed before personalization could be contemplated to suffocate personalized rules in the crib. 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 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 private actors trying to anticipate what courts might do. Because the tradeoffs are significant, we advocate beginning with personalized default rules in the easiest cases, followed by incremental advances if early results are promising.

Personalized default rules and personalized disclosure are just two pieces, albeit important ones, 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,[182] the debate over tort law's eggshell skull doctrine,[183] and takings doctrine's focus on a landowner's "distinct, investment-backed expectations." 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. 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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[182] *See* Adam M. Samaha, *Litigant Sensitivity in First Amendment Law*, 98 NW. U. L. REV. 1291 (2004).

[183] *See, e.g.*, Dennis Klimchuck, *Causation, Thin Skulls, and Equality*, 11 CANADIAN J.L. & JURISPRUDENCE 1158 (1998).

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