
# *Arizona Legal Studies*

Discussion Paper No. 16-17

## A Bad Education

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June 2016

# A BAD EDUCATION

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Mandated disclosure laws achieve their regulatory goals by educating the public about latent attributes of a product or service. At their best, they improve the accuracy of consumers' cost-benefit analyses compared to a world without disclosure and inspire firms to reduce unnecessary risks. But when mandated disclosures do not improve cost-benefit assessments—when they are useless or, worse still, when they reduce the quality of those assessments—then they constitute a bad education.

American privacy law, which is principally a mandated disclosure regime, imposes a bad education on consumers. This article proposes a theory for differentiating valuable disclosures from wasteful and harmful ones. Valuable disclosures provide notice about material attributes without inducing an overreaction. After validating the theory in an experimental setting using disclosures about health risks, moral risks, and pseudoscience, we apply the model to four distinct forms of privacy invasive practices. We find that the disclosures required by regulators are usually wasteful and may cause consumers to overreact. This is the first study to compare disclosures about privacy practices to disclosures about other types of attributes. It raises for the first time a troubling insight: if consumer law were guided by the same justifications as our privacy law, it would have to mandate disclosures about GMOs, animal testing, and an unlimited range of other attributes that produce visceral responses.

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## INTRODUCTION

Mandated disclosures are a form of compulsory education. Disclosure laws aim to bring salutary effects to the market by providing useful information to consumers and by inspiring the introspection of firms. The central mechanism is a quick and dirty education that on balance improves customers' assessment of the true costs and benefits of a product.[1] When mandated disclosures improve the accuracy of a cost-benefit analysis compared to a world without disclosure, they provide a good enough education to achieve the regulatory goals. But when mandated disclosures do not improve cost-benefit assessments, when they are wasteful or worse still, when they reduce the quality of assessments, mandated disclosures are a *bad education.* These disclosures could only be rationalized, if they are to be rationalized at all, on paternalistic, ends-justified terms. A bad education can serve consumer interests only if it nudges them to take actions that are inconsistent with their preferences but still "good for them" by some external metric.

[1] Sometimes the education process works through intermediaries rather than directly educating each consumer. For example, some disclosures help a small group of "watch dog" consumers who have enough influence on market demand to change the behavior of firms. Other disclosures educate doctors and other gatekeepers who make key decisions for end users. Edwin Gale, *Collateral Damage: The Conundrum of Drug Safety,* 52 DIABETOLOGIA 1975 (2009) (describing the limits of doctor and consumer watchdogs for ensuring drug safety).

American privacy law is on a track headed for bad education. This Article presents and tests a theory for differentiating mandated disclosures that on balance misinform consumers rather than informing them. Applying the theory to four distinct forms of privacy invasions in an experimental setting, we find that the disclosures encouraged by regulators are often useless and can sometimes be worse than useless. They typically direct consumer attention to privacy features that do not matter. At their worst, they cause consumers to over-react. By making privacy risks salient without highlighting the functionality and other benefits that come along with the data practices, privacy disclosures can induce customers to avoid services that they would prefer to have if they were better informed.

These results and their implications will surprise many lawmakers, as they challenge the primary regulatory approach to privacy. American consumer privacy law centers on notice. Because Americans have heterogeneous preferences about data privacy—some caring deeply about it, some caring not at all, and others somewhere in between[2]—American lawmakers have tried to facilitate efficient outcomes through informed consent.[3] State statutes in California and Utah require websites and app developers to disclose what types of data are collected and the circumstances under which data is shared.[4] Federal law requires the same for banks and online services directed at children.[5] And the Federal Trade Commission strongly urges all firms to provide notice through privacy policies even if disclosure is not mandated.[6] This approach to privacy policy is based on an autonomy model. It is meant to satisfy and tolerate variance in Americans' taste for privacy risks.[7]

American firms are frequently criticized for the failure to ensure meaningful notice about potential privacy risks at the time that consumers

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[2] Ponnurangam Kumaraguru & Lorrie F. Cranor, *Privacy Indexes: A Survey of Westin's Studies,* ISRI TECH. REPORT, CMU-ISRI-05-138 (2005), at http://reports-archive.adm.cs.cmu.edu/anon/isri2005/abstracts/05-138.html.

[3] FEDERAL TRADE COMMISSION, PROTECTING CONSUMER PRIVACY IN AN ERA OF RAPID CHANGE: RECOMMENDATIONS FOR BUSINESSES AND POLICY MAKERS (2012) [hereinafter FTC, RAPID CHANGE]; THE WHITE HOUSE, CONSUMER DATA PRIVACY IN A NETWORKED WORLD: A FRAMEWORK FOR PROTECTING PRIVACY AND PROMOTING INNOVATION IN THE GLOBAL DIGITAL ECONOMY (2012) [hereinafter WHITE HOUSE, CONSUMER DATA PRIVACY].

[4] Online Privacy Protection Act of 2003, CAL BUS. & PROF. CODE §§22575-79; Notice of Intent to Sell Nonpublic Personal Information Act, UTAH CODE ANN. §§13-37-101 et seq.

[5] Financial Services Modernization Act of 1999, 15 U.S.C. §6803 (the "Gramm-Leach-Bliley Act"); Children's Online Privacy Protection Act of 1998, 15 U.S.C. §§6501-06. ("COPPA")

[6] FTC, RAPID CHANGE, *supra* note 3 at 61.

[7] George J. Stigler, *An Introduction to Privacy in Economics and Politics,* 9 J. LEGAL STUD. 623 (1980); Chris J. Hoofnagle et al., *Behavioral Advertising: The Offer You Can't Refuse,* 6 HARV. L. & POL'Y REV. 273 (2012).

are making decisions.[8] According to privacy scholars and advocates, deficiencies in the timing and format of privacy disclosures prevent individuals from making informed and autonomous choices. Thus, they have recommended legal requirements for "just-in-time" notice in plain language and other more aggressive forms of disclosure.[9] That is, regulators are considering doubling down on privacy notices by forcing companies to make simple warning-style interventions at key decision-making moments. Enthusiasm for "just-in-time" notice rests on the assumption that a quick informational shock will jolt consumers to make more rational choices that better conform to their true long-term preferences.

The existing theoretical support and explanations for mandated disclosures is incomplete and, in the context of privacy, incoherent. Some rationales for disclosure focus on enhancing autonomy by making it easier for consumers to match their preferences to products. Others focus on nudging companies to engage in safer practices. The autonomy and nudging models are in an unresolved tension. The autonomy model assumes that people do not assign the same value to privacy, while the nudging model assumes that there are objectively better and worse ways to handle personal data. A broad mandate for privacy disclosure does not serve either model well. Mandated disclosures provide at best a partial education. The education focuses on consumer risks exclusively, and often without providing a sense of real world consequences. The rationales for disclosure have not accounted for the possibility, even a probability, that these partial educations can be worse than no education at all.

This article advances for the first time a complete theoretical model that can account for both productive and counterproductive disclosure regimes. We then demonstrate our model's validity and apply the model to privacy using a small experiment. We posit that mandated disclosures are good policy only if they meet three criteria. They must be *material, proportional,* and *suitable.*

To be material and proportional, consumer choices under the notice regime must be closer to the choices that consumers would have made if they were thoroughly educated about the costs and benefits of the disclosed attribute than choices made without any notice at all. There are no "perfectly educated" consumers, of course, but we can approximate their choices using well-enough educated consumers. We give well-enough educated consumers comprehensible information about both the costs of a

[8] CHRIS J. HOOFNAGLE & JENNIFER KING, RESEARCH REPORT: WHAT CALIFORNIANS UNDERSTAND ABOUT PRIVACY ONLINE (2008); Robert A. Hillman, *Online Boilerplate: Would Mandatory Website Disclosure of E-Standard Terms Backfire?,* 104 MICH. L. REV. 837 (2006).

[9] FEDERAL TRADE COMMISSION, MOBILE PRIVACY DISCLOSURES: BUILDING TRUST THROUGH TRANSPARENCY 15 (2013).

privacy-invading technology and the benefits of those privacy invasions in the form of improved functionality, decreased prices, and other indirect positive effects. Together, materiality and proportionality ensure that a disclosure regime avoids creating a bad education. Materiality ensures that the suspect attribute is one that the consumer would care about if he took the time to learn about it, and proportionality ensures that the disclosure doesn't cause an over-correction.

The third element is suitability. This element is the hardest to define, but crucial to include because the range of attributes that meet the materiality and proportionality requirements is limitless. We use suitability to mean that a particular attribute is particularly worthy of extra attention through disclosure laws and that other, more direct types of government responses to the information failure would be impractical.[10] We tentatively argue that material information is suitable for disclosure when there is a clear consensus about the harm of the attribute (e.g. health risks or financial losses), when the government can develop clear reporting standards, and when direct regulations are difficult to design well.[11] A brief tour of successful and widely-embraced mandated disclosures is consistent with this approach: mandatory reporting of nutrition information, hospital infection rates, and restaurant hygiene grades have all of these qualities.[12]

Privacy has no such consensus. Consumers frequently spurn privacy-protective products and services, and experts disagree on whether the resulting data-sharing has harmful or helpful societal consequences.[13] When the privacy practices of a company do have clearly bad consequences to their customers (e.g. when the company fails to adopt rudimentary data security for customer payment data[14]), regulators can more effectively protect consumers by prohibiting specific practices or requiring certain

[10] Clifford Winston, *supra* note _ at 715 (using a similar analysis).
[11] *See* David Dranove & Ginger Zhe Jin, *Quality Disclosure and Certification: Theory and Practice,* 48 J. ECON. LIT. 935, 937-38 (describing alternative means to achieve quality assurance).
[12] *See* our discussion *infra* Part II(a).
[13] *Compare* JULIE COHEN, CONFIGURING THE NETWORKED SELF: LAW, CODE, AND THE PLAY OF EVERYDAY PRACTICE 107-26 (2012); Anita Allen, *Coercing Privacy,* 40 WM. & MARY L. REV. 723 (1999) *with* Jane Bambauer, *Is Data Speech?,* 66 STAN. L. REV. 57 (2014); Eric Goldman, *The Regulation of Reputational Information,* in THE NEXT DIGITAL DECADE: ESSAYS ON THE FUTURE OF THE INTERNET (Berin Szoka & Adam Marcus, eds. 2010).
[14] J. Howard Beales, III & Timothy J. Muris, *Choice or Consequences: Protecting Privacy in Commercial Information,* 75 U. CHI. L. REV. 109, 132 (2008) ("An unfairness theory is sound when security deficiencies are clear, have resulted in intentional breaches that are highly likely to lead to fraudulent use of the information, and low-cost steps that would significantly reduce the risk are readily apparent.").

precautions.[15] But for the vast majority of privacy-related practices, disclosure either does nothing at all or short-circuits thoughtful analysis of the costs and benefits of a privacy-invasive feature.[16]

The Article proceeds as follows. Part I summarizes the existing theories of mandated disclosure and evidence about its efficacy in both the general context and as it relates to privacy. Part II states our theory of a good mandated disclosure law. Part III presents the results of an experiment in which we validated our theory using health, social, and pseudoscientific disclosures and then applied the methods to privacy. This is the first experiment to test the effects of disclosure across multiple policy domains. We conclude that our model successfully separates useful, useless, and harmful disclosure regimes, and that the results from the privacy scenarios raise doubts about the utility of disclosure. Part IV addresses limitations and objections.

Many scholars and lawmakers have assumed that mandated privacy disclosures are an "unarguable improvement over a situation in which consumers are left in the dark."[17] But this is not necessarily the case—consumers are sometimes better off in the dark than in a false light.

## I. WHAT WE KNOW SO FAR ABOUT MANDATED DISCLOSURE

American law has a famously diverse array of mandated disclosure requirements. Some are precise and narrowly drawn to particular product or service attributes, such as the Berkeley, California, law requiring cell phone manufacturers to warn about radiation risks or the New York City ordinance requiring chain restaurants to report calorie counts on their menus. Others use broad-sweeping standards, such as the Securities & Exchange Commission requirement that all publicly traded firms disclose any "material information" related to the firm's operations or financial condition.[18] The last four decades have seen a proliferation of disclosure laws because they can overcome political stalemates. Disclosure laws advance regulatory goals (satisfying regulators) but only very weakly (satisfying regulated entities).[19]

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[15] Others have pointed out that focus on voluntary privacy disclosures "with dubious effectiveness may come at the cost of focusing on solutions that get at the heart of the privacy problem." Idris Adjerid et al., *Sleights of Privacy: Framing, Disclosures, and the Limits of Transparency, in* PROCEEDINGS OF THE NINTH SYMPOSIUM ON USABLE PRIVACY & SECURITY (2013).

[16] J. Howard Beales, III & Timothy J. Muris, *Choice or Consequences: Protecting Privacy in Commercial Information,* 75 U. CHI. L. REV. 109 (2008).

[17] Adjerid et al., *supra* note 15.

[18] 15 U.S.C. §77(e).

[19] MARY GRAHAM, DEMOCRACY BY DISCLOSURE: THE RISE OF TECHNOPOPULISM (2002).

Disclosure regimes vary in philosophy as well as subject matter. Some are designed to facilitate sorting in the marketplace while others attempt to nudge firms and consumers to behave differently. In the abstract and their specifics, mandated disclosures attract enthusiastic supporters, skeptics, and severe critics, each coming armed with evidentiary support. This Part organizes the existing theories and empirical evidence. When the rationales for mandated disclosure are disaggregated, there is some hope for clearing a path to good policymaking. There is some hope, that is, for separating well-founded and valuable information disclosures from the thicket of misguided disclosures.

Subpart A describes the general state of knowledge about disclosures, and Subpart B scans the literature on privacy disclosures. One note on scope: this Article concerns only mandated disclosures—information provision that is compelled by the government. We do not address regulatory actions that verify and enforce information or promises voluntarily provided by a firm. There are many very good reasons to design a regulatory system that enforces promises that may have contributed to a consumer's decision to purchase a product or service. If a firm voluntarily states that certain things will be done with a customer's data, or that a product will cause a particular health outcome, enforcement when the promises are broken does nothing more than clear the market of fraud.[20] These sorts of credibility enforcement mechanisms can often help both businesses and consumers by getting over the "cheap talk" problem—that is, by instilling trust that if a company says their product does something, it actually will.[21] This project does not question the wisdom of these regulations. It does not question, for example, the Federal Trade Commission's dominant approach to privacy enforcement, which has until recently done nothing more than hold companies to the promises they voluntarily make to consumers.[22] But the Federal Trade Commission's recommendation (and potential future requirement) that companies use just-in-time disclosure to alert consumers about the privacy consequences of a product or service does fall within our scope of inquiry.

### *A. The General Story*

[20] Daniel J. Solove & Woodrow Hartzog, *The FTC and the New Common Law of Privacy,* 114 COLUM. L. REV. 583 (2014).
[21] Joseph Farrell & Matthew Rabin, *Cheap Talk,* 10 J. ECON. PERSP. 103 (1996); Paul M. Healy & Krishna G. Palepu, *Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature*, 31 J. ACCT. & ECON. 405, 406, 408 (2000).
[22] Solove & Hartzog, *supra* note 20.

Mandated disclosure is celebrated for its light touch approach to regulation. The quest to overcome information asymmetries is consistent with a robust free market in which consumers know better than technocrats which costs and risks they should take on.[23] And because disclosure rules are often used as an alternative to direct regulations that would reduce the choices of both firms and consumers, they attract broad support.[24]

At its best, mandated disclosure can serve two functions: enhancing consumer autonomy, and providing a regulatory nudge. These two purposes are in some tension, and the literature has struggled to find a conclusive explanation for when one or both purposes can be served (let alone when they should be).

The autonomy or "technopopulist" [25] model for disclosure aims to give consumers useful and truthful information to let them manage their own preferences. Disclosure can help consumers understand the latent costs of a product or service so that they make their consumption decisions based on full prices rather than sticker prices.[26]

The nudge model uses disclosure to induce specific actions. By making unfavorable attributes of a product more salient to consumers, the government can create new market pressure for companies to change exploitative practices or reduce risks as best they can.[27] For example, California's Safe Drinking Water and Toxic Enforcement Act of 1986 forced companies to disclose when their products expose consumers to toxic chemicals in order to encourage companies to substitute those chemicals for suitable alternatives, not to give consumers the freedom to choose their preferences among chemicals.[28]

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[23] Omri Ben-Shahar & Carl E. Schneider, *The Failure of Mandated Disclosure,* 159 U. PENN. L. REV. 647, 681 (2011).

[24] *Id.* at 684.

[25] MARY GRAHAM, DEMOCRACY BY DISCLOSURE: THE RISE OF TECHNOPOPULISM (2002).

[26] BRYAN CAPLAN, THE MYTH OF THE RATIONAL VOTER 17 (2007) ("Economists call the total cost—explicit and implicit—of an activity its 'full price.' Though less visible than a printed price tag, the full price is the one that matters most.")

[27] We discuss the nudge model in greater detail for the context of privacy in Part II(b). A third justification for mandated disclosure is to prompt competition by newcomer firms by forcing established firms to reveal their methods. Allen Ferrell, *The Case for Mandatory Disclosure in Securities Regulation Around the World* 6 (Olin Center Discussion Paper No. 492), at http://www.law.harvard.edu/programs/olin_center/papers/pdf/.Ferrell_492.pdf. We do not take up this theory except to note here that it can backfire by eliminating the incentives for firms to develop novel cost-saving methods in the first place if they know competitors will easily replicate them. *See* Joanna Shepherd, *Is More Information Always Better? Mandatory Disclosure Regulations in the Prescription Drug Market,* 99 CORNELL L. REV. ONLINE 1 (2013).

[28] Clifford Rechtschaffen, *The Warning Game: Evaluating Warnings Under California's Proposition 65*, 23 J. ECOLOGY L. QUART. 303, 305-306 (1996).

These two approaches to mandated disclosure can be partially separated by understanding whether the disclosure relates to a product attribute that has a *common value* or a *private value*—that is, whether people generally value the attribute the same (common value) or whether people have heterogeneous valuations (private value).[29] The autonomy model facilitates consumer decisions driven by private values. At its purest, the autonomy model is indifferent about outcomes. It has no predetermined expectations for how producers and consumers should react to the disclosed information. It simply aims to give consumers a more complete set of details about a product or service so that he can determine the value based on his personal taste. The SEC rules for corporate disclosure and the FDA requirement that foods list their ingredients come closest to the pure autonomy model. Privacy law is often described (by regulators, at least) as autonomy-driven, too.

The nudge model, by contrast, is very concerned about outcomes. Nudge-style disclosures attempt to reduce a bad product attribute that has roughly the same negative value for all consumers. Known health and financial risks share a common value since nobody wants to get sick or lose money. Thus, nudge-based disclosure regimes have a particular effect in their sights: the reduction of hospital infections, or the reduced use of toxic chemicals, for example. The hope is that disclosure will prompt consumers avoid products that are more costly than they realized and will have a "tell-tale heart effect" on disclosers, leading them to reduce risk and harm prior to disclosure.[30]

In practices, these two models often merge. Most forms of mandated disclosure blend the models by requiring disclosure about unambiguously bad risks and costs while respecting consumers' decisions to take on those risks in order to access some benefit. Home mortgage and prescription drug disclosures consciously serve both functions.

Regulators and the scholarly literature are rarely explicit about which goal—autonomy or nudging—provides the basis for government action, and consequently it isn't usually clear how success of the program should be judged. This might not be entirely coincidental where the government intends to use disclosure as a nudge to change consumer and firm behaviors on attributes that do not actually share a common value. When this occurs, the government may violate the First Amendment compelled speech doctrine. For example, the SEC rule that would have required companies to declare when their products contain conflict minerals

[29] JOHN H. KAGEL & DAN LEVIN, COMMON VALUE AUCTIONS AND THE WINNER'S CURSE (2002).

[30] For a description of the tell-tale heart effect and other effects of disclosure nudges, *see generally* George Loewenstein et al., *Disclosure: Psychology Changes Everything,* 6 ANNUAL REV. ECON. 391 (2013).

was expressly designed to achieve a social goal rather than to help investors make better-informed choices.[31] This express admission doomed the rule to constitutional demolition on free speech grounds.[32] Nevertheless, when disclosure rules concern commonly valued bad attributes, social and informational goals can converge.

Lauren Willis, working with both the autonomy and nudge frames, has provided some prospective guidance. Mandated consumer education is appropriate "when consumers need to understand erstwhile non-salient costs and risks of a transaction to make welfare-enhancing decisions, and consumer decisional autonomy is sufficiently valuable to be worth its significant costs."[33] Willis covers two factors critical to good disclosure rules: that the information is truly *needed*—that it solves a problem—and that direct regulation is nevertheless inappropriate. Based on the existing evidence, both factors turn out to be unwieldy.

First, it is unclear when consumers need additional information. In theory, it should never be necessary, since market processes would "unravel" useful and unflattering information about the products.[34] In theory, even if all firms perform poorly on some measure, the firms that perform the least worse would flaunt their relatively high quality, causing other firms to disclose lest their silence be taken for guilt.[35] But to quote Homer Simpson, "In theory, Communism works. . . In theory."[36]

History leaves no doubt that market competition routinely spurs voluntary disclosure both by firms and by third parties.[37] Amazon does not have to be compelled to provide product dimensions, and job applicants do not have to be forced to provide transcripts and resumes. But the market can fail to produce important information to customers for a few reasons. First, collective action problems can limit the market's ability to produce information in a uniform manner that would be most efficient for consumers to understand. Disclosure laws can solve a coordination problem by

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[31] Securities & Exchange Commission Rules & Regulations on Conflict Minerals, 77 Fed. Reg. 56273, 56350 (Sept. 12, 2012).
[32] Nat'l Ass'n of Manufacturers v. S.E.C., 800 F.3d 518 (D.C. Cir. 2015).
[33] Lauren Willis, *Performance-Based Consumer Law,* 82 U. CHI. L. REV. 1309 (2015).
[34] Paul Milgrom, *What the Seller Won't Tell You: Persuasion and Disclosure in Markets*, 22 J. ECON. PERSPECTIVES 115 (2008). Indeed, the terms themselves, whether related to privacy or something else, should be efficient even if the consumer is uninformed. David Gilo & Ariel Porat, *Viewing Unconscionability Through a Market Lens,* 52 WILLIAM & MARY L. REV. 133 (2010).
[35] Healy & Palepu, *supra* note 21 at 411; Sanford Grossman & Oliver Hart, *Disclosure Laws and Takeover Bids,* 35 J. FIN. 323 (1980); David Dranove & Ginger Z. Jin, *Quality Disclosure and Certification: Theory and Practice,* 48 J. ECON. LIT. 2010 935, __ (2010) (Note: look for the page for section 2.1. I only have a pre-print version.)
[36] The Simpsons: Bart Gets an Elephant (Gracie Films March 31, 1994).
[37] Dranove & Jin, *supra* note 11 at 9-10 (describing the history of voluntary and third-party disclosures).

requiring uniform reporting standards.[38] Accounting rules for public corporations and nutrition labels for food are well-known for serving this function, but many forms of disclosure do not.

More relevant to privacy, market information failures can also occur when consumers assume that an industry has better practices than it actually does. In these instances, firms may be reluctant to disclose the truth even if they out-perform their peers because consumer resentment of the whole could outweigh appreciation for the particular firm. There is some evidence, for example, that producers of "natural" cigarettes took advantage of consumer ignorance by letting consumers wrongly assume that the health risks from smoking come primarily from additives.[39] However, these market information failures may be the exception rather than the rule, as there is also ample evidence that competition did lead to unraveling disclosures by cigarette producers that gave consumers an appreciation for the dangers of all cigarettes.[40]

Companies can wind up in a disclosure standoff when consumer expectations are lower than actual performance, too. When all members of an industry add more value, or impose fewer costs, than their customers realize, they may each rationally hold off taking the effort to educate consumers since their competitors would benefit, too. Each producer would be able to free-ride while their rivals incur the costs of public education. Regulators often exacerbate the void in positive disclosures by prohibiting firms from advertising in a way that could mislead customers into thinking the company's product is uniquely beneficial when competitors' products share the same positive feature.[41]

There are other explanations for the failure of the market process to smoke out useful information for consumers and investors. For example, consumers can have temporally inconsistent preferences so that one set of factors (predominantly price and functionality) dominate their decision-making at the time of purchase while other factors become more important to them later. In any case, while the frequency of market failures is not

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[38] Healy & Palepu, *supra* note 21 at 412.

[39] Paul Milgrom & John Roberts, *Relying on the Information of Interested Parties*, 17 RAND J. ECON. 18 (1986); Patricia A. McDaniel & Ruth E. Malone, *'I Always Thought They Were All Pure Tobacco': American Smokers' Perceptions of 'Natural' Cigarettes and Tobacco Industry Advertising Strategies*, 16 TOBACCO CONTROL 7 (2007).

[40] JOHN E. CALFREE, FEAR OF PERSUASION: A NEW PERSPECTIVE ON ADVERTISING AND REGULATION 46-52 (1997).

[41] *Id.* at 98; Anthony Ramirez, *Three Companies Cited on Cholesterol Claims,* N.Y. TIMES (May 15, 1991), http://www.nytimes.com/1991/05/15/business/company-news-3-companies-cited-on-cholesterol-claims.html (describing the FDA's response to Mazola Vegetable Oil's "cholesterol free" claim when all vegetable oils are cholesterol free); Manoj Hastak & Michael B. Mazis, *Deception by Implication: A Typology of Truthful but Misleading Advertising and Labeling Claims,* 30 J. PUB. POL'Y & MKTG. 157 (2011).

known, we do know that it happens. Stephen Choi and Mitu Gulati found that issuers of sovereign bonds were more likely to disclose relevant information that investors already knew and less likely to disclose relevant information that investors did not know.[42] And a study of Health Maintenance Organizations found that HMOs do engage in voluntary disclosures to help differentiate their services, but that these voluntary disclosures were counterintuitively *less* common in more competitive markets.[43]

When mandated disclosures have been used to tackle a perceived information failure, the reviews are mixed. Friends and foes of the regulatory state seem to agree that mandated disclosure is prone to problems. First, consumers often do not read disclosures, even when they sign or click that they have.[44] Even when information is available, it is not necessarily salient.[45] This does not necessarily prevent disclosure laws from having salutary effects on the market since a small group of influential consumer watchdogs and media outlets can have great effects on consumer attitudes, but the effects are likely to be muted if the attribute is not salient at the time a purchasing decision is made.[46]

Critics also find fault in the range of tactics that corporations can use to avoid the regulatory purpose. Companies can take advantage of disclosure regimes by technically disclosing an exploitative practice in boilerplate language and then using the disclosure to insulate themselves from litigation.[47] They can also design their disclosures to defuse the message, distract the consumer, or otherwise wriggle out from under the full effects of mandated disclosure rules.[48] Yet these critics may have unrealistic expectations about what an average consumer will consider during a purchase. Consumers respond to overall ratings information, but rarely dig

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[42] Stephen J. Choi & G. Mitu Gulati, *Empirical Study of Securities Disclosure Practice,* 80 TULANE L. REV. 1023 (2006).

[43] Ginger Zhe Jin, *Competition and Disclosure Incentives: An Empirical Study of HMOs*, RAND J. ECON. 93 (2005).

[44] Ben-Shahar & Schneider, *supra* note 23. This is related to the problem of "information overload"—a problem whose very existence is questionable. *See* Alan Schwartz et al., *The Irrelevance of Information Overload: An Analysis of Search and Disclosure,* 59 S. CAL. L. REV. 277 (1986).

[45] GIANLUIGI GUIDO, THE SALIENCE OF MARKETING STIMULI: AN INCONGRUITY-SALIENCE HYPOTHESIS ON CONSUMER AWARENESS 165 (2001).

[46] Sharon Shavitt & Russell H. Fazio, *Effects of Attribute Salience on the Consistency of Product Evaluations and Purchase Predictions, in* 17 NA-ADVANCES IN CONSUMER RESEARCH VOLUME 91 (Marvin E. Goldberg et al., eds., 1990).

[47] Ben-Shahar & Schneider, *supra* note 23 at 739 (describing the HUD-Treasury Task Force on Predatory Lending).

[48] Ryan Calo, *Against Notice Skepticism in Privacy (and Elsewhere),* 87 NOTRE DAME L. REV. 1027 (2012); GRAHAM, *supra* note 19.

deeper into the details breakdowns of various qualities.[49] Crude, simple disclosures can be more effective at provoking a reaction, but the very crudeness that induces a reaction may misinform consumers. Given the range of ways that disclosure can have counterproductive effects or no effect at all, some scholars have raised legitimate questions about whether the costs of information disclosure regimes are justified.[50] To date, there is no consensus. Indeed, economists are still debating the wisdom of compelled disclosure even in the context of the stock exchange.[51]

The strongest evidence in support of mandated disclosure comes from contexts in which there is universal agreement about what a "good" outcome would be. When Los Angeles first required restaurants to publicly display their letter grade from the health department, restaurants rapidly improved their compliance with the public health code.[52] Similarly, the introduction of nutrition labels lowered the fat content in salad dressings.[53] And a Pennsylvania law requiring the disclosure of infection rates at hospitals prompted healthcare providers to take measures to reduce their infection rates.[54] These programs achieved commonly valued health and safety goals without heavy-handed regulations that would dictate how firms reduce their risks. If we assume that the restaurants, salad dressing manufacturers, and hospitals reduced risks in cost-effective ways (without increasing the price or reducing quality on other dimensions[55]), the effects of disclosure are clearly positive. For these examples, the autonomy and nudge models lead to the exact same results, since all customers value cheap reductions of health risks.

When these assumptions about common negative values and cost-effective means for reducing them are relaxed, the evidence is impenetrable.

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[49] Jin, *supra* note 43.

[50] Ben-Shahar & Schneider, *supra* note 23.

[51] Healy & Palepu, supra note 21 at 412; Roberta Romano, *Empowering Investors: A Market Approach to Securities Regulation*, 107 YALE L. J. 2359 (1998); Ferrell, *supra* note 27.

[52] Ginger Jin & Phillip Leslie, *The Case in Support of Restaurant Hygiene Grade Cards*, 20 CHOICES 97 (2005). *But see* Winston, *supra* note _ at 710; Daniel E. Ho, *Fudging the Nudge: Information Disclosure and Restaurant Grading,* 122 YALE L.J. 574 (2012) (finding that restaurant letter grades did not improve restaurant hygiene and that the public grading systems were riddled with grade inflation, inconsistency, and public choice problems).

[53] Alan D. Mathios, *The Impact of Mandatory Disclosure Laws on Product Choices: An Analysis of the Salad Dressing Market*, 43 J. L. & ECON. 651 (2000).

[54] PENNSYLVANIA DEPT. OF HEALTH, HEALTHCARE-ASSOCIATED INFECTIONS IN PENNSYLVANIA: 2011 REPORT (2011); Edward S. Wong et al., *Public Disclosure of Healthcare-Associated Infections: The Role of the Society for Healthcare Epidemiology of America,* 26 INFECTION CONTROL & HOSP. EPIDEMIOLOGY 210 (2005). Note, though, that hospital grades have led to a systemic problem of hospital avoidance of the sickest patients. Dranove, Kessler, McClellan, and Satterthwaite, 2003.

[55] Dranove & Jin, *supra* note _ at *16-17

Even the area of financial disclosures has produced surprisingly sparse and conflicting data.[56] California's Safe Drinking Water and Toxic Enforcement Act of 1986, described above, also has a contested legacy. It requires a notice that the product offered for sale contains "chemicals known to the State of California to cause cancer" on a comically broad range of products.[57] While the law probably helped reduce the use of toxic chemicals in products, it also interferes with consumer decision-making by requiring warnings about chemicals that federal regulators consider safe, or that occur in such trace amounts that harm is nearly impossible.[58] So the law may not only drain consumer attention spans, but cause costly over-reaction for the few consumers who are still paying attention.

Overreaction can occur when disclosures cause consumers to overestimate the risks or discount the benefits of a product. Since effective disclosures are necessarily crude and incomplete in order to attract the consumer's attention, the chance that a disclosure can cause overreaction is significant. The potential for consumer overreaction is well-documented. For example, mandated disclosures of brokerage fees cause consumers to concentrate only on the disclosed fees rather than total costs.[59] A Federal Trade Commission study of brokerage fee disclosures found that the disclosures caused a large portion of consumers chose to avoid broker loans in response to the disclosures even when the brokered loans cost less than

[56] Healy & Palepu, *supra* note 21 at 412 (describing the lack of study and observing "This is surprising given the central role regulation plays in disclosure, and the limitations of the economic arguments supporting regulation."). George Stigler in an early study of securities laws found that mandated disclosures did not add value to the prices of stocks, but did improve stock volatility. George Stigler, *Public Regulation of the Securities Market,* 37 J. BUS. 117 (1964). Other studies find that financial disclosures provide new and useful information for investors as they value stocks, but cannot determine whether the most useful information would have been flushed out anyway. Healy at 413. And Allen Farrell points out that many of the older studies did not have good controls, and did not answer the question he believes is most important: whether mandated disclosure improves stock price accuracy. Allen Ferrell, *Measuring the Effects of Mandated Disclosure,* 1 BERKELEY BUS. L. J. 369, 372 (2004). For a full discussion of the empirical literature, concluding that there is no evidence securities disclosure laws have added little value, *see* Clifford Winston, *The Efficacy of Information Policy: A Review of Archon Fung, Mary Graham, and David Weil's* Full Disclosure: The Perils and Promise of Transparency, 46 J. ECON. LIT. 704, 707-08 (2008).

[57] Brendan Borrell, *Are Proposition 65 Warnings Helpful or Hurtful?*, L.A. TIMES (Nov. 2, 2009), http://www.latimes.com/health/la-he-pro-con2-2009nov02-story.html.

[58] *Id.*

[59] Ben-Shahar & Schneider, *supra* note 23 at 737 (quoting Richard Craswell, *Taking Information Seriously: Misrepresentation and Nondisclosure in Contract Law and Elsewhere*, 92 VA. L. REV. 565, 584 (2006)).

direct loans.[60] Similarly, hospital "report cards" can give consumers the impression that a hospital with a low grade provides subpar service when in fact they are merely serving a population that is sicker and more at risk.[61]

Prescription drug labels cause overreaction problems, too. One study found that drugs that actually have a 10% chance of causing side effects were estimated based on the disclosure language to have a 45% chance of occurrence by consumers and a 25% chance of occurrence by doctors.[62] And a 10-year study about the effects of the severe "black-box" warning that the FDA requires most antidepressants to carry found that doctors overreacted to the warning.[63] After the introduction of the warning, doctors became reluctant to diagnose major depression and to prescribe antidepressants, and this correlated with a dramatic spike in suicide attempts.[64]

Health professionals have never been as enthusiastic about mandatory disclosures of non-serious side effects for treatments as their patients have, in part because lay audiences believe that side effects are more serious than they are.[65] Even when consumer estimations of risks are accurate, regulators and proponents of mandated disclosure have a difficult time testing whether consumers understand the tradeoffs in price or functionality when the risks are reduced.[66] The potential for consumer overreaction is a centerpiece of the theoretical model that we present in Part III. But it is rarely given sustained consideration in policy debates. This is certainly true of the literature on privacy disclosures, where we suspect overreaction is likely to occur. We discuss the state of the debate on privacy disclosures in the next Part.

More generally, existing evidence has not provided a reliable way of assessing when an information market failure has resulted in consumer harm, much less whether the government is able to ameliorate such a

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[60] James M. Lacko & Janis K. Pappalardo, *The Effect of Mortgage Broker Compensation Disclosures on Consumers and Competition: A Controlled Experiment,* FEDERAL TRADE COMM'N BUREAU OF ECON. STAFF REPORT (2004).

[61] David Dranove et al., *Is More Information Better?: The Effects of 'Report Cards' on Health Care Providers,* 111 J. POLIT. ECON. 555 (2003).

[62] *Id*. at 698 (quoting Peter Knapp et al., *Communicating the Risk of Side Effects to Patients: An Evaluation of UK Regulatory Recommendations*, 32 DRUG SAFETY 837, 838-39 (2009).

[63] Richard A. Friedman, *Antidepressants' Black-Box Warning—10 Years Later,* 371 N. ENGL. J. MED. 1666 (2014).

[64] Id.; Christine Y. Lu et al., *Changes in Antidepressant Use by Young People After FDA Warnings and Media Coverage: Quasi-Experimental Study*, 348 BMJ g3596 (2014).

[65] Charles Keown, *Attitudes of Physicians, Pharmacists, and Laypersons Toward Seriousness and Need for Disclosure of Prescription Drug Side Effects*, 3 HEALTH PSYCH. 1 (1984).

[66] ALAN LEVY & MANOJ HASTAK, CONSUMER COMPREHENSION OF FINANCIAL PRIVACY NOTICES: A REPORT ON THE RESULTS OF THE QUANTITATIVE TESTING (2008).

problem. In the words of Clifford Winston, disclosure requirements "have amounted to weak solutions in search of a problem."[67]

*B. Applications to Privacy*

The dominant conceit in information privacy law is autonomy. By forcing firms to be transparent about how they collect and share personal data, consumers can manage their own preferences and make informed choices.[68] Since there is no social consensus about the harms and benefits of personal data-collection and dissemination, information about a company's practices can help people manage their own privacy and match themselves to the products and services they want.[69]

There is also general agreement that companies would not provide consumers with enough information about how their data is collected and used if left to their own devices.[70] The literature has not settled on an explanation for why market forces would fail to unravel information through voluntary disclosures. Firms are capable of competing on privacy by marketing their services as privacy-respecting alternatives to Google[71], and in fact many companies voluntarily developed privacy policies before any state mandated their public display. But because consumers are stubbornly resistant to paying premiums or losing functionality in exchange for enhanced privacy[72], the most competitive firms use personal data aggressively.

Some have concluded, based on this short history, that there is no market failure. Although consumers claim to have great concern about the collection and use of their personal data, their conduct and choices even with good information belies their concerns.[73] Another explanation, though, is that consumers do not appreciate how voracious the information service industry is, and so the industry refrains from disclosing clear information because even the firms that are relatively privacy-respecting will disappoint consumer expectations. Transparency can spark competition on the basis of

[67] Winston, *supra* note _ at 704.
[68] Daniel Solove, *Introduction: Privacy Self-Management and the Consent Dilemma*, 126 HARV. L. REV. 1880 (2013).
[69] Willis, *supra* note 33 at 1373.
[70] *Id.* ("The marketplace currently does not ensure that the interests of consumers and firms are well-aligned when it comes to personally-identifiable data collection and use.").
[71] Molly Wood, *Sweeping Away a Search History,* N.Y. TIMES, April 2, 2014, at B9 (describing DuckDuckGo).
[72] Janice Y. Tsai et al., *The Effect of Online Privacy Information on Purchasing Behavior: An Experimental Study,* 22 INFO. SYS. RESEARCH 254, 264 (2011) (even with information about the privacy implications, consumers are willing to pay just a 62 cent premium on average for privacy about the purchase of a sex toy).
[73] Eric Goldman, *The Privacy Hoax,* FORBES (October 14, 2002).

privacy once consumers realize how bad things have become, or at the very least, it can force companies to make more thoughtful decisions about their data practices in the process of drafting privacy policies.[74] A third possibility is that consumers are resigned. Because they believe there is no use to managing privacy with one company since many other companies already have and share their data, firms may not be able to convince consumers about the value of their privacy-enhancing services.[75]

One possible explanation for presumption of a market failure is that many authors writing in the area of privacy law and policy harbor a cynical view of the marketplace.[76] Like the general public, privacy scholars often assume that something that benefits a company must cause an equal and opposite harm to the consumer.[77] Dan Solove argues that privacy notices help protect consumers from "clandestine rationales"[78], and Lauren Willis assumes that the interests of consumers and companies are often and increasingly misaligned.[79] By this logic, market failure is the rule rather than the exception. But for all the anxiety about the pernicious effects of Big Data, the evidence of market failure and widespread predation is contested. In fact, there is at least some evidence of market health. Firms like DuckDuckGo and Mozilla do compete for customers on the basis of privacy practices.[80] The adult industry has some of the highest standards for privacy, systematically avoiding collecting and sharing information about its users.[81] This is entirely consistent with the idea that companies generally

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[74] AMERICAN LAW INSTITUTE, PRINCIPLES OF THE LAW: DATA PRIVACY §2 (Preliminary Draft No. 1).

[75] JOSEPH TUROW ET AL., THE TRADE-OFF FALLACY: HOW MARKETERS ARE MISREPRESENTING AMERICAN CONSUMERS AND OPENING THEM UP TO EXPLOITATION (2015); Patrick G. Kelley et al., *A 'Nutrition Label' for Privacy,* PROCEEDINGS OF THE FIFTH SYMPOSIUM ON USABLE PRIVACY & SECURITY (2009).

[76] Another possibility is selection effects. Privacy scholars may be attracted to the field because they have a strong preference for privacy, and value the harms of privacy loss more than the general public.

[77] CAPLAN, *supra* note 26 at 30 (general public); Tal Zarsky, *Digital Behavioral Advertising—Why Worry?,* JOTWELL (December 3, 2014) (reviewing Ryan Calo, *Digital Market Manipulation,* 82 GEO. WASH. L. REV. 995 (2014)) (exposing this assumption in Calo's work).

[78] Daniel Solove, *Introduction: Privacy Self-Management and the Consent Dilemma*, 126 HARV. L. REV. 1880 (2013).

[79] Willis, *supra* note 33 at 1317, 1374.

[80] Duckduckgo, About Us, https://duckduckgo.com/about ("Take back your privacy!"); Mozilla Support, Settings for Privacy, Browsing History and Do-Not-Track, https://support.mozilla.org/en-US/kb/settings-privacy-browsing-history-do-not-track.

[81] Florencia Marotta-Wurgler, *Understanding Privacy Policies: Content, Self-Regulation, and Market Forces* (unpublished manuscript, available at http://www.law.uchicago.edu/files/file/marotta-wurgler_understanding_privacy_policies.pdf).

do not want to harm or embarrass their clients, and that customers pay attention to privacy when it is important to them.

Although the most common justification for mandated privacy disclosure is to empower consumers to make choices consistent with their own preferences, the empirical privacy literature reveals a different motive. Many (not all) of the studies on the effects of privacy disclosures treat the consumer's willingness to share personal information as evidence of a failure, and conversely treat consumer reserve as success.[82] By setting a desired outcome, the researchers abandon their commitments to respect consumer choices no matter what they are.[83]

Much of the research is motivated by the "privacy paradox." Consumers consistently claim to value privacy highly and then make decisions that run against their stated interests.[84] Privacy researchers are eager to overcome the paradox by finding fault with the decisions that consumers make rather than with the aspirational statements that they make. They have identified a variety of ways that companies can manipulate language or framing to encourage consumers to violate their own preferences.[85] But a second wave has challenged the exploitation view. Kirsten Martin has shown that the privacy paradox may not be a paradox at all, and may be an optical illusion produced by the hypercontextual nature of privacy.[86] New research by Lior Strahilevitz and Matthew Kugler finds

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[82] Adjerid et al., *supra* note 15 (although the authors make clear in the analysis section that their Experiment 1 is only a test of framing effects, the introduction and conclusion of the paper uses this evidence to argue that privacy disclosures fail to adequately steer consumers away from disclosing information.); Leslie K. John et al., *Strangers on a Plane: Context-Dependent Willingness to Divulge Sensitive Information,* 37 J. CONSUMER RES. (2011) (concluding that cues and context cause people to divulge more sensitive information by "downplaying privacy concerns" without questioning whether the more direct contexts could overemphasize privacy); Tsai et al., *supra* note 72.

[83] Or, more generously, the nudge is designed to satisfy consumers' second order preferences for long term goals like privacy and financial security over first order preferences like convenience, goods and services. *See* Cass R. Sunstein, *Legal Interference with Private Preferences,* 53 U. CHI. L. REV. 1129 (1986).

[84] Alessandro Acquisti et al., *The Economics of Privacy* 37-38 (available at http://people.duke.edu/~crtaylor/Privacy_Survey.pdf); Alessandro Acquisti, *Privacy in Electronic Commerce and the Economics of Immediate Gratification, in* PROC. OF THE FIFTH ACM CONF. ON ELECTRONIC COM. 21 (2004).

[85] For studies finding that consumer behavior is irrational, *see* Laura Brandimarte et al., *Misplaced Confidences: Privacy and the Control Paradox*, *in* NINTH ANNUAL WORKSHOP ON THE ECON. OF INFO. SECURITY (2010); Alessandro Acquisti et al., *Gone in 15 Seconds: The Limits of Privacy Transparency and Control,* 11 IEEE COMPUTER SOCIETY 72 (2013).

[86] Kirsten E. Martin & Katie Shilton, *Experience, Trust, and Privacy in Mobile Space*, J. ASSOC. INFO. SCIENCE & TECH. (forthcoming 2015); Kirsten E. Martin, *Transaction Costs, Privacy, and Trust: The Laudible Goals and Ultimate Failure of Notice and Choice to Respect Privacy Online*, 18 FIRST MONDAY (Dec. 2, 2013), available at http://firstmonday.org/ojs/index.php/fm/article/view/4838/3802.

that people understand perfectly well the bargain that is struck with Facebook and Google and that their eagerness to access these services is not affected by the language and framing of privacy notices.[87] An experiment by Omri Ben-Shahar and Adam Chilton found that using suggested "best practices" to provide clear, timely notice about privacy practices did not change consumer behavior.[88] And a study performed by Microsoft researchers found that even when consumers were educated about how data was collected and used for web searches and then presented with the option to maintain complete web search privacy, only 16% were willing to spend half a penny per search to maintain their privacy, whereas 61% were willing to pay that price to enhance the quality of search results, and 47% were willing to pay half a penny just to have their search terms highlighted in their results.[89]

In short, there is little evidence that market failure is the chief cause of American privacy woes. But there is a different justification for mandated privacy disclosures—one that does not rely on satisfying the diverse preferences of consumers. The nudge theory of disclosure aims to induce consumer concern. Idris Adjerid argues that transparency about personal data practices can "counter the status quo in which privacy concerns are secondary in online decision making."[90]

Alessandro Acquisti gives a more nuanced expression of the disclosure nudge. Acquisti argues that privacy disclosures may help reduce the problem of inter-temporal inconsistencies in preferences.[91] He explains the gaps between privacy attitudes and actual consumer choices through problems of self-control and immediate gratification.[92] This could be summarized as the Twinkie theory of privacy: although consumers do

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[87] Lior J. Strahilevitz & Matthew B. Kugler, *Is Privacy Policy Language Irrelevant to Consumers?* (October 6, 2015) (unpublished manuscript, available at http://www.law.uchicago.edu/files/file/strahilevitz_kugler_is_privacy_policy_language_irrelevant_to_consumers.pdf).

[88] Omri Ben-Shahar & Adam Chilton, *"Best Practices" in the Design of Privacy Disclosures: An Experimental Test* (October 5, 2015) (unpublished manuscript, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2670115).

[89] Soren Preibusch, *The Value of Privacy in Web Search,* THE TWELFTH WORKSHOP ON THE ECON. OF INFO. SECURITY (2013).

[90] Adjerid et al., *supra* note 15.

[91] Ted O'Donoghue & Matthew Rabin, *Doing It Now or Later,* 89 AM. ECON. REV. 103 (1999), George A. Akerlof, *Procrastination and Obedience,* 81 AM. ECON. REV. 1 (1991).

[92] Alessandro Acquisti & Ralph Gross, *Imagined Communities: Awareness, Information Sharing, and Privacy on the Facebook*, *in* PRIVACY ENHANCING TECHNOLOGIES 36 (George Danezis & Philippe Golle, eds., 2006); Acquisti, *Immediate Gratification*, *supra* note 84; Alessandro Acquisti & Jens Grossklags, *Privacy and Rationality in Individual Decision Making*, IEEE SECURITY & PRIVACY, Jan./Feb. 2005 at 26 ("we show why individuals who may genuinely want to protect their privacy might not do so because of psychological distortions…")

voluntarily make choices with knowledge of the consequences, the choices they make are short-sighted. Without some help, such as a stark reminder about the consequences at the crucial point of decision-making, consumers may systematically choose badly and regret the cumulative effects of their choices.

Acquisti's account may very well have merit. Hyperbolic discounting by consumers is pretty well documented in the behavioral economics literature.[93] But the problem of hyperbolic discounting is relevant only if the loss of privacy brings clear long-term net costs to users.[94] At the moment this is an open question. Some of Acquisti's own research shows that consumers doubt that there will be negative consequences from sharing their personal data since they do not protect their privacy even when doing so would be costless, and even when they do not receive any immediate gratification in return.[95]

Moreover, even if we assume that instant gratification may distort consumer behavior, there are other well-documented biases that would push in the other direction. Loss aversion and the endowment effect would suggest that people value their hoarded personal information more than the market, and would take extra efforts to avoid losing control of it.[96] And status quo biases and aversions to commoditization would resist innovations that change the information ecosystem.[97] If disclosures activate these biases, consumer behavior may be distorted toward secrecy, and could nudge consumers away from their optimal choices. More generally, disclosure nudges are difficult to do well. As Daniel Ho has pointed out, "the contextual nature of behavioral effects also makes it difficult to extend findings from one arena to the next."[98]

With few exceptions[99], privacy scholars have not grappled with the possibility that the effect of mandated disclosure, to the extent they have

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[93] George Ainslie, *The Effect of Hyperbolic Discounting on Personal Choices,* Keynote Speech at the Annual Convention of the American Psychological Association (Aug. 22, 2002).

[94] Acquisti, *Immediate Gratification, supra* note 84 (Tables 1 and 2).

[95] Alessandro Acquisti & Ralph Gross, *Imagined Communities,* PET 2006 *19 (2006) (showing that students who learned about Facebook privacy settings during research did not go on to change their revelation patterns afterwards as compared to the control group).

[96] Alessandro Acquisti & Jens Grossklags, *What Can Behavioral Economics Teach Us About Privacy?,* ETRICS (2007).

[97] Juan P. Carrascal et al., *Your Browsing Behavior for a Big Mac: Economics of Personal Information Online,* INTERNATIONAL WORLD WIDE WEB PROCEEDINGS (2013).

[98] Daniel Ho, *supra* note _ at 655.

[99] Pedro G. Leon et al., *Nudges for Privacy and Security: Understanding and Assisting Users' Choices Online*, 1 ACM COMPUTING SURVEYS 1, 29 (2015) ("Previous literature has studied nudges in contexts with relatively clear desired outcomes, such as saving money or eating healthier. The context of privacy and security decision making may not necessarily share this feature, as the costs of intrusions are often intangible or difficult to measure. An

any effect at all, can be a counter-productive one. Simple disclosures at the critical time of decision-making can cause an overreaction by requiring attention be paid to privacy threats without providing information about the practical consequences of data collection (which may be benign) or the practical benefits that would be lost if privacy were better protected.

In the next Part, we present a theory of mandated disclosure that salvages what is useful from the existing literature and incorporates the risk of overreaction.

## II. A THEORY OF DISCLOSURE AS A GOOD OR BAD EDUCATION

The literature on mandated disclosures has not reached sufficient clarity about when compelled disclosures are a worthwhile form of regulation.

We attempt to model and define a successful disclosure regime by imagining a consumer with a fixed set of preferences under three different conditions. An unwarned consumer makes a decision without any mandated disclosure about the suspect attribute. The warned consumer makes the decision with the mandated disclosure about the suspect attribute. And an idealized perfectly educated consumer makes the decision with perfect information about both the costs of the suspect attribute and the benefits of the attribute. These benefits are usually product functionality that would be lost if the suspect attribute were eliminated. These well-educated consumers are much more informed than warned consumers because mandated disclosures rarely supply consumers with details about the scale of risks and almost never provide information about the benefits that would be lost if the attribute were removed. Note that the idealized, perfectly educated consumer does not exist (even among experts). In our experiment, we assume that a moderately well-educated consumer who has access to basic information about the scale of costs and benefits of an attribute will make very similar decisions to the ideal consumer.

We offer a three-part test for determining when mandated disclosure provides a good and worthwhile education. Mandated disclosure is wise when it is (1) material, (2) proportional, and (3) suitable.

The first requirement for a good mandated disclosure is *materiality*. Disclosure is only worthwhile if on average, a consumer who is well-educated about both the risks and the benefits of a suspect attribute would make different consumption decisions from the unwarned consumer (with the same underlying preferences). Materiality does not ask simply whether

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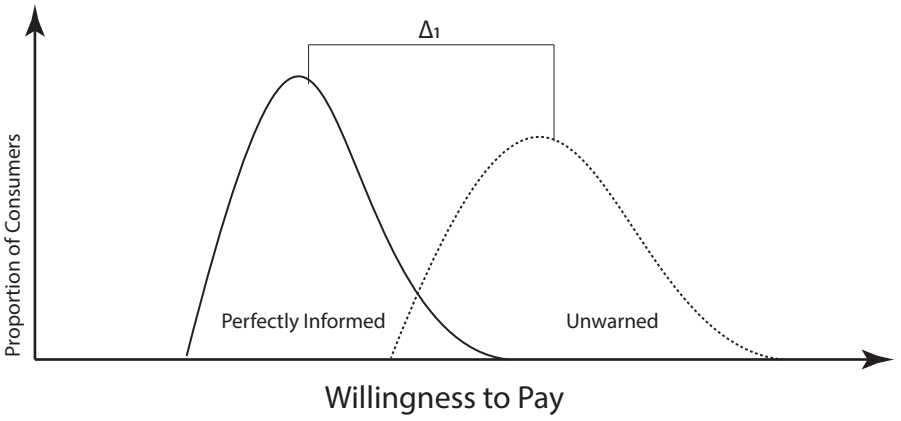
overly simplistic approach may be to minimize [personal disclosure] or encourage users to always implement stringent security controls. This approach, however, is flawed, as [personal disclosures], while increasing privacy risks, may also lead to some economic, social, or personal gain.").

disclosures can cause consumers to behave differently. As we show, there is an irreducible effect from providing notice about any product attribute. Notices have an inherent negative valence and will always cause consumers to value a product differently, so if materiality were to compare unwarned and warned consumers, every mandated disclosure would meet the test.

To properly assess materiality, one must compare the unwarned consumer to a perfectly educated consumer who understands the costs and benefits of the attribute and its relative importance compared to other attributes. If on average the perfectly informed consumers have lower reserve prices than the unwarned consumers, materiality will be met.[100]

Graphically, finding materiality in the distributions of consumers' willingness to pay for a particular product or service could look like this:



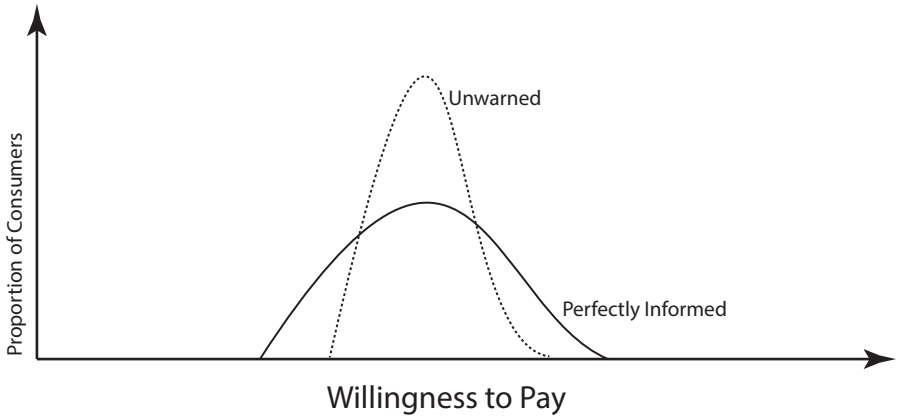

The shift in the distributions ($\Delta_1$) shows that many consumers overvalue the product because they do not understand a latent negative feature. It is not necessarily the case that *all* consumers will value the product less with proper information; a consumer's relative place within a distribution may change when all are "perfectly informed." But the gap between the medians of the distributions suggest that better information might help consumers make more accurate assessments of a product's value.

Conversely, if perfect information does not cause a shift in average consumer behavior ($\Delta_1=0$), then the attribute is not a material one. This would occur when the unwarned and perfectly informed curves are the same, or are at least distributed around the same average price.

[100] We use differences in averages to define materiality. However, because willingness to pay is usually skewed right (like income), in our experiment we use averages of the natural log of the reserve price. The function ln(price) produces a distribution that is much closer to normal. Throughout this article we report prices in dollars rather than log-dollars for the sake of readability, but for our analyses of statistical significance, we use mean log-price.

There are at least two ways that an attribute could be material in the conventional sense of the word without meeting our definition of materiality ($\Delta_1$=0). First, it is theoretically possible for information to change the decisions of every consumer without producing any change in the curve at all. This could happen if consumers come in with varying default expectations about the suspect attribute *and* if the consumers who had assumed the attribute would be worse than it actually is are roughly similar in number and error to the consumers who had assumed the attribute would be better than it actually is.[101] If better information cause the consumers with optimistic default assumptions to lower their willingness to pay while causing consumers with pessimistic assumptions to raise their willingness to pay, the corrections could cancel each other out. While the curves for unwarned and perfectly informed consumers would look identical, in fact the consumers with perfect information would better match their willingness to pay to their preferences. In practice, these mirror-opposite corrections are probably unlikely to occur.[102] As long as the correction for optimists is a little larger or a little smaller than the correction for pessimists, the curve will shift and materiality will be satisfied.

A second, more realistic way that information could affect consumer choices without meeting our materiality test is if perfect information changes the shape of the distribution curve without making a difference to the average price consumers are willing to pay.




[101] For example, suppose half the population assumes that a drug has a 1% chance of causing a particular side effect, and the other half assumes the drug has a 5% chance. If the true statistic were 2%, and if disclosure of this fact caused each group to react in perfectly symmetrical ways, the disclosure would help the consumer price the product more accurately even though the mean and shape of the curve would stay the same.

[102] We did, however, collect data in our experiment that could provide an indicator that consumers approach their pricing decision with strong assumptions about the attribute, and we have found no evidence that this happened for the attributes we tested.

In economic terms, these attributes would affect the variance of consumer choices without changing the averages. For the example above, perfect information about an attribute would spread consumers out along the willingness to pay axis even though the curves are still centered around the same average.

Our definition of materiality carves these out for pragmatic and policy reasons. The pragmatic reason is that true changes in variance are very difficult to measure. Because the perfectly informed consumer is a fiction, we must model it using a reasonably well-educated consumer. But the process of education has an influence on the relative weight a consumer will place on the attributes receiving attention. As one attribute is made salient through education, the sustained attention it receives may cause the educated group to become more spread out or more tightly bound even if the attribute actually has trivial importance to the consumers. Our suspicions that the education process can distort the spread of consumer responses were validated by our experimental results.[103] In contrast, if the average price that consumers are willing to pay falls, we can at least have some confidence that an education causes people (on average) to feel differently about the attribute.

The policy reasons for leaving changes in variance out of the definition of materiality are related. Legislatures are no more equipped than researchers at measuring differences in variance that produce no differences to the average. Moreover, if an attribute actually causes great spread among a customer base without affecting average prices, market competition should reward firms for voluntary disclosure in some (though not all) circumstances.[104] As it is, crafting regulation to make improvements on averages is difficult enough. Designing law around subtler changes may not be the wisest use of scarce resources.[105]

It is well worth keeping in mind that the indifference to variance in our definition of materiality only applies to situations in which there is no difference in means. As long as consumers are spread out by better information in a way that shifts the curve to center around slightly lower prices, materiality will be met. For example, the materiality element would be met in this case:

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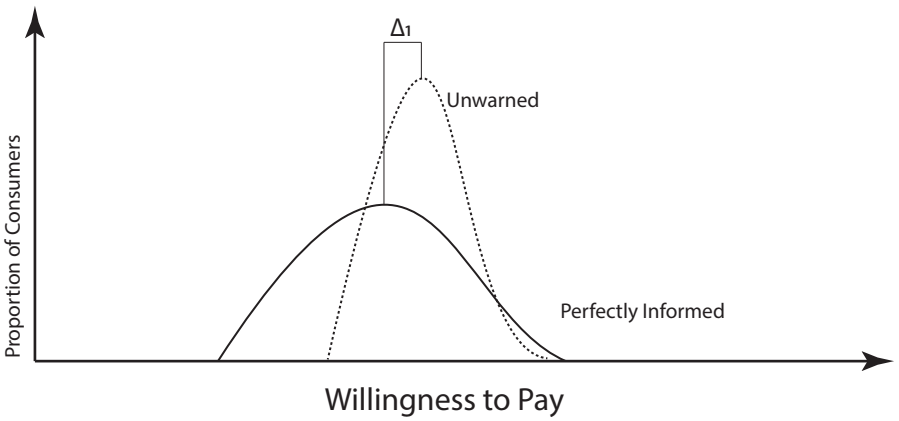
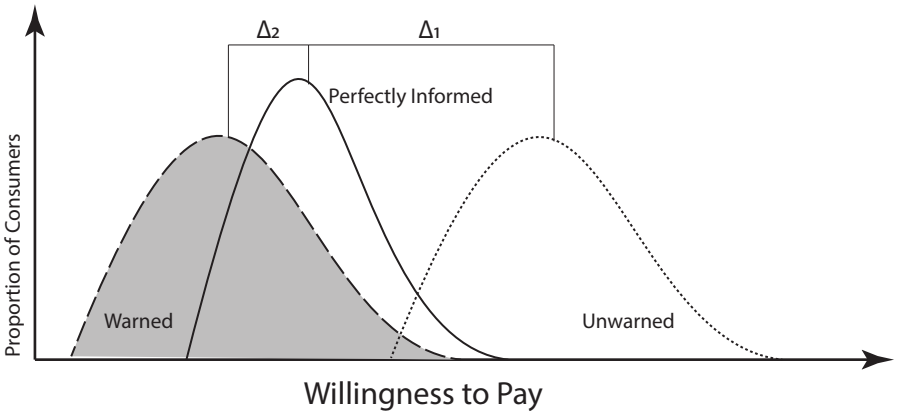
[103] *See* our discussion of the pure notice effect *infra* Part III(A).

[104] This will depend on the shapes of the curves. In the example we provide, a producer should attract the same or a greater proportion of potential consumers at every market price by disclosing the attribute.

[105] We take up this issue at more length *infra* Part III(F).

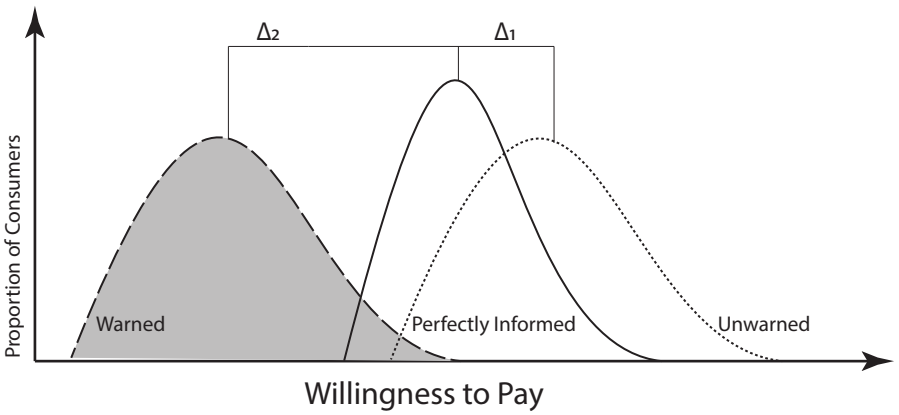



The second requirement for good disclosure is *proportionality*. Since disclosures are necessarily crude forms of education that focus attention on risk and potential harm, disclosure provides a net benefit only if a warned consumer (who receives disclosure) makes consumption decisions more similar to the well-educated consumer than the unwarned consumer does. Proportionality ensures that mandated disclosure will not cause a counterproductive over-reaction. Proportionality can be added to the materiality illustration as so:




This illustration depicts a disclosure scheme that is proportional because even though the scheme causes some overcorrection, the bias from overcorrection ($\Delta_2$) is smaller than the bias when there is no disclosure at all ($\Delta_2 < \Delta_1$).

But if a disclosure regime caused the distributions to shift such that the bias after disclosure is worse than the bias before disclosure ($\Delta_2 > \Delta_1$), then mandated disclosure would not meet the proportionality requirement.




Together, materiality and proportionality ensure that a mandated disclosure provides a good education. Materiality checks that there are information inefficiencies that *can* be reduced by education, and proportionality ensures that a mandated disclosure will reduce them without introducing new inefficiencies from overreaction.

Materiality and proportionality are necessary conditions for good disclosure policy, but they are not sufficient on their own. As we will show, many product attributes satisfy the materiality and proportionality thresholds. The third requirement, which is somewhat difficult to define and harder still to measure, is *suitability.* This final step asks if the game is worth the candle.[106] It requires the government to think through why the material attribute is best regulated through information engineering rather than through direct limitations and prohibitions on the company's conduct. And it also requires a justification for selecting the chosen attribute for compelled consumer salience over other attributes that consumers would or could care about. To meet this requirement, there must be a reason to make the chosen product attribute more salient, and other attributes less salient.[107]

Suitability is an important analytical step because the government could pick an unlimited number of attributes that meet the materiality test. Product features that are invisible to most consumers like environmental impact or rare health risks can often meet materiality, but if the government were to compel disclosure about all of them, it would exhaust the attention of consumers. Thus, compelled disclosure runs the risk of arbitrarily exposing some latent attributes and not others.[108] Lauren Willis captures the suitability idea when she argues that companies should have to educate their

[106] Or, as Ben-Shahar and Schneider have asked, "Is mandated disclosure the best form of regulation?" Ben-Shahar & Schneider, *supra* note 23.
[107] Mandated disclosure risks crowding out other, more useful information. *Id.* at 737.
[108] Worse still, the compelled disclosure may be not arbitrary at all. It might be the result of political pressure from incumbent firms trying to resist competition. Healy & Palepu, *supra* note 21 at 412 (discussing potential regulatory capture problems).

consumers about a "small number of important product dimensions that tend to be underappreciated[.]"[109] The trouble is how to pick which product dimensions are less appreciated than they should be. For example, we find that consumers are as sensitive to animal testing as they are to the sale of personal data to Pharmaceutical researchers. Is there any principled reason to demand disclosure for one and not the other? We pick up this question later in the article, where we can make use of our experimental results.

## III. THE EXPERIMENT

We conducted an online survey administered through Amazon's Mechanical Turk to validate our theoretical model and to begin to answer some questions about the wisdom of privacy disclosures. We presented each research subject with a vignette—a short description that asks the subject to imagine they are making a decision about buying a good or service—and we manipulated features of the vignette to study differences across survey respondents.

We randomized research subjects across two dimensions. First, subjects were assigned one of eleven different product offers that presented different types of suspect attributes: health threats, moral threats, pseudoscientific threats, privacy threats, and an irrelevant attribute (to measure a pure notice effect.) For the second dimension, the vignette simulates the unwarned, warned, and perfectly educated consumer. Survey respondents were randomly assigned to one of five types of disclosures:

> **Level 0 (unwarned):** Shows and describes the product/service only. No information about the suspect attribute.
>
> **Level 1 (just-in-time warning):** Same as Level 0 but also identifies the suspect attribute.
>
> **Level 2-risk (warning and risk disclosure):** Same as Level 1 but also describes the risk from the attribute — the scale consequences and chance that the harms will occur.
>
> **Level 2-benefits (warning and benefits disclosure):** Same as Level 1 but also describes the benefits from the attribute— the functionality that would be lost if the attribute were removed.
>
> **Level 3 (well-educated):** Combines all information—same as Level 1 but also describes both the risks and the benefits of the attribute.

[109] Willis, *supra* note 33 at 1357.

We then asked the respondent for their reserve price—the highest price they were willing to pay for the product or service. For example, a research subject assigned to the level 3 (well-educated) DNA Kit scenario would have seen all of the following vignette:

Unwarned

You can buy a DNA testing service. The service takes a sample of your saliva and creates a profile of your ancestry and your chances of developing certain medical conditions.

Warned

NOTICE: The company offering this service sells access to its customers' DNA data to pharmaceutical companies.

Well-Educated

(risk)

Your identifying information is not included in the database that pharmaceutical companies can access. The pharmaceutical companies use the data to conduct medical research that may lead to the development of new treatments.

(benefit)

By selling access to the DNA database, this DNA service can afford to offer the testing kit for sale directly to you. Previously, DNA health analysis was available only at a doctor's office.

Above which price would you definitely not buy the service because you didn't think it was worth the money?

We will describe the vignettes in more detail as we work through the results below. The vignettes are designed to manipulate the product offer and the disclosure levels without significantly adding to the word count, so even our "well-educated" survey respondents were given limited information. However, they had access to at least some detail about the scale of the suspect feature's costs and the trade-offs from trying to reduce those costs.

This research design allows us to study materiality and proportionality of "just-in-time" warnings (level 1), which most closely mimic the language of mandated disclosures as they appear in the real world. We also briefly analyze the more detailed risk disclosures (level 2-

risk) which better imitate privacy-related disclosures that are available to consumers who take the time to look for them.

For each scenario, we examine whether disclosure would be material and proportional. To be material and proportional, the well-educated responses must be more similar to the disclosure responses than they are to the unwarned responses. Conversely, if the respondents' values under conditions of disclosure are much lower than the well-educated respondents' values, then the disclosures probably cause a harmful over-reaction. Using the model described in Part III, a disclosure is material and proportional only if $\Delta_1 \neq 0$ and $\Delta_2 < \Delta_1$.

We estimate $\Delta_1$ and $\Delta_2$ three different ways using the willingness to pay variable. First, we graphically present the distributions of respondents' willingness to pay so that readers can see the shapes of the distributions and the differences between them.[110] Second, we report the median for each cohort and indicate statistical significance (based on the mean of log prices to normalize skew.) And third, we report the proportion of respondents who valued the product at $0, which we interpret as a measure of consumer exit from the product's market.

At the end of the vignette, we also asked a short set of questions about the respondent's decision-making process and desire for legally mandated disclosure of the suspect attribute.

Our study, like all vignette surveys, has the disadvantage of measuring effects in highly contrived conditions where the study subjects do not have any actual money at stake. But the artificiality also works to our advantage since it allows us to carefully control everything about the presentation of the product or service so that we can attribute differences in reactions to differences in disclosure levels. Also, although we will use a survey as our instrument, we do not take self-reported willingness to pay information at face value. The real analytical strength comes from comparing the reactions of survey respondents to others who were presented with the same scenario under a different type of disclosure. Existing research has demonstrated that self-reported privacy attitudes are particularly poor predictors of consumer choices under realistic conditions and constrained option sets requiring trade-offs[111], so what is revealed

[110] Because reserve prices are right-skewed, some of the graphs cut off outliers so that the curves are not badly compressed. We cropped fewer than 10% of the observations in these graphs.

[111] Alessandro Acquisti & Jens Grossklog, *Privacy and Rationality in Individual Decision-Making*, 2 IEEE SECURITY & PRIVACY 24 (2005); Sarah Spiekermann et al., *E-Privacy in 2nd Generation E-Commerce: Privacy Preferences Versus Actual Behavior*, PROC. OF THE 3RD ACM CONFERENCE ON ELECTRONIC COMMERCE 38 (2001). Instead, research subjects' perceptions about the downstream risks or benefits outperform privacy attitudes in

through between-subject comparisons will better capture the effects of disclosure. In other words, we "measure privacy without asking about it."[112]

This is the first study, as far as we know, to compare the reactions to disclosure across a range of attributes so that the appropriateness of any one disclosure regime can be put into the larger context of a world of products and services with an unlimited number of latent features.

### *A. The Pure Notice Effect*

For this vignette, survey respondents were randomly distributed across the five levels of disclosure about a completely irrelevant ingredient in shaving cream:

| |
|---|
|  |
| You can buy a 10 oz can of shaving cream. |
| NOTICE: The shaving cream contains the chemical Laureth-4. |
| Laureth-4 has been tested for safety, and all tests suggest that it does not cause any skin irritation or other health problems. |
| Laureth-4 helps create the creamy texture in shave creams. |

Ideally, rational consumers would not react to the additional information about Laureth-4 since it would not have relevance to the costs or benefits of shaving cream to the average consumer. We chose Laureth-4 precisely because consumers will not have preexisting opinions or feelings about it. If respondents were perfectly rational, we should see evidence that disclosure about Laureth-4 produces results where $\Delta_1 = \Delta_2 = 0$. However, we were concerned that the very existence of a disclaimer could have an effect even if the disclaimer is meaningless. If we see any effect from the notice, this will be evidence of a "pure notice effect" and our experiment will help give us a concrete sense of its scale.

We found a statistically significant notice effect.[113]

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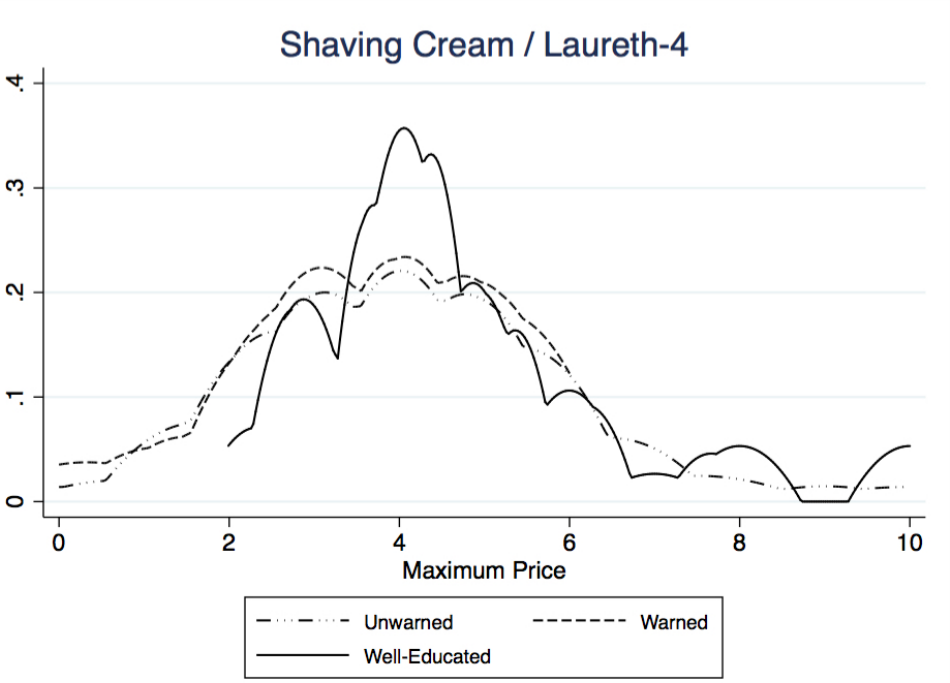
predicting consumer willingness to disclose personal information. Alison Woodruff, *Would a Privacy Fundamentalist Sell Their DNA for $1000… If Nothing Bad Happened as a Result?: The Westin Categories, Behavioral Intentions, and Consequences*, PROC. OF THE SYMPOSIUM ON USABLE PRIVACY & SECURITY: SOUPS '14 (2014).

[112] Alex Braunstein et al., *Indirect Content Privacy Surveys: Measuring Privacy Without Asking About It*, SOUPS 2011 (2011).




| | Median Price/ (Mean Log-Price) | Proportion of $0 Value |
|---|---|---|
| Unwarned (n=38) | $4.00 | 2.6% |
| Warned (38) | $3.88* | 5.2%* |
| Well-Educated (40) | $4.00 | 0.0% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

The differences in willingness to pay are almost undetectable in the graph. The median price for the warned group was very slightly lower than the median for the Well-Educated group, but that small difference was statistically significant.[114] Disclosure may have also caused some respondents to exit the market. (We take this with a grain of salt, since 2.6% of the unwarned respondents were not willing to pay even a penny for our shaving cream.) Therefore, policymakers should understand that every mandated disclosure introduces the possibility of nudging consumers away from their preferred outcomes by providing an incomplete education.

[113] Throughout this article, we analyze statistical significance based on differences in means of the natural log of reserve prices—ln(price). Because reserve prices are right-skewed, we analyzed the natural log of price so that the distributions were normally distributed.

[114] Statistical significance is based t-tests of the differences in average natural log of price.

We do not see any differences between the unwarned group and the well-educated group at the median. This is encouraging because it suggests that we will not need to worry unduly that the well-educated group becomes biased (either warming toward the product or viewing it skeptically) by the process of education.[115]

However, we do see differences in the shape of the distribution. The education process concentrated the reserve prices of our respondents. We suspect this change in the variance of the curve is caused by salience. The respondents' attention was sustained on a factor that did not matter, but that concentration may have distracted respondents from the factors that did matter. In other words, some of the survey respondents' decision-making capacity was exhausted by their (correct) assessment that Laureth-4 is irrelevant, and they therefore lacked capacity to think about other factors, like how often they use shaving cream, whether they would prefer to stay with their own brand, et cetera.

The pure notice exercise therefore teaches us three things. First, the existence of a notice will induce a small negative reaction even if the attribute is non-material. Second, an education process can effectively de-bias consumers about the particular attribute. But third, the education process will also make the attribute more salient, causing consumers to give the attribute more weight than they would under conditions with no notice.

### *B. Health Risks*

Health risks have relatively common value, so we can use disclosures about health risks to further validate our methodology. We tested three health scenarios: the presence of arsenic in rice (very low risk / no alternatives), addiction risks in vicodin [medium risk / subpar alternatives], and cardiovascular risks in Vioxx [high risk / good alternatives]. To be useful, our methodology should reject mandated disclosure in the rice scenario and accept it in the Vioxx scenario, and indeed our results suggest precisely that.

The rice scenario alerted respondents to the presence of arsenic in a bag of rice.[116] Well-educated respondents were taught that the trace levels of arsenic are harmless for consumers and unavoidable for rice farmers.

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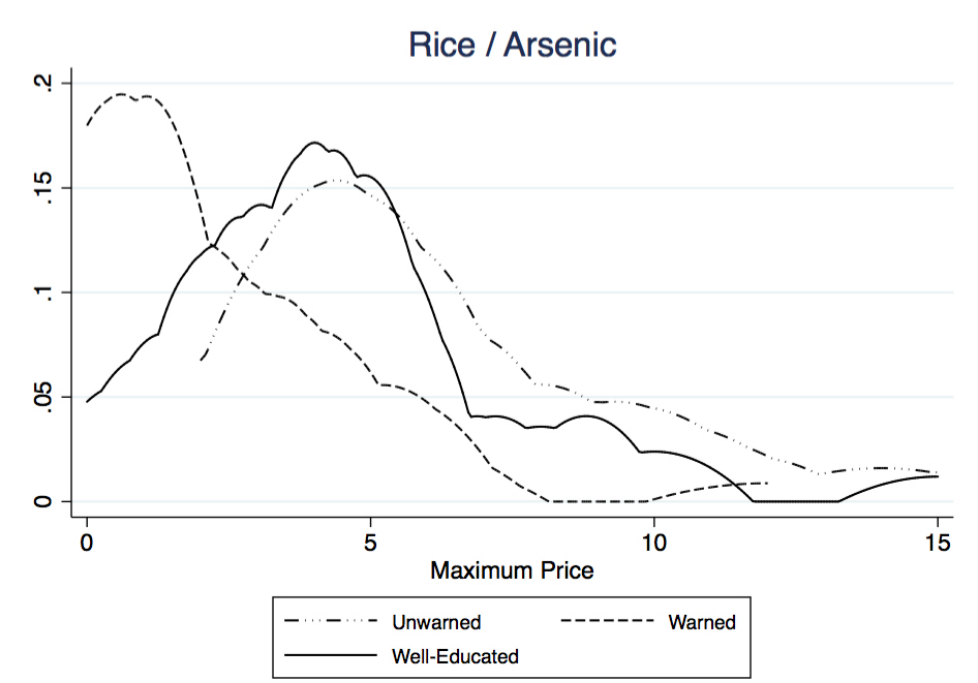
[115] In analyses not reported here, we also tested whether the word "Notice:" used in the vignettes for the warned and well-educated groups had an effect on willingness to pay by retesting one of the vignettes (the DNA kit) without the word. We found no significant differences.

[116] Text: "You can buy a 32 oz package of long grain white rice./ NOTICE: The rice contains arsenic./ The amount of arsenic is too small to cause health problems. / Arsenic is naturally occurring and cannot be avoided in rice and many other common foods."




| | Median Price/ (Mean Log-Price) | Proportion of $0 Value |
|---|---|---|
| Unwarned (40) | $5.00* | 0.0% |
| Warned (41) | $1.00*** | 31.7%*** |
| Well-Educated (38) | $4.50 | 2.6% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

The arsenic attribute meets the materiality criterion because even fully-educated consumers lose some interest in rice after having to confront the fact that rice and other foods have small amounts of arsenic. This materiality could be troubling if we believe that consumers should not care about trace levels of toxins that have no substantive effect on health. These results would show that in contrast to the shaving cream example, an education cannot undo the overly negative associations that people have with arsenic. But an alternative perspective is that people have a visceral, unpleasant reaction to arsenic and that those feelings affect their experience, even if they are not entirely rational. Under this perspective, the values for the educated group really are more representative of "true cost."

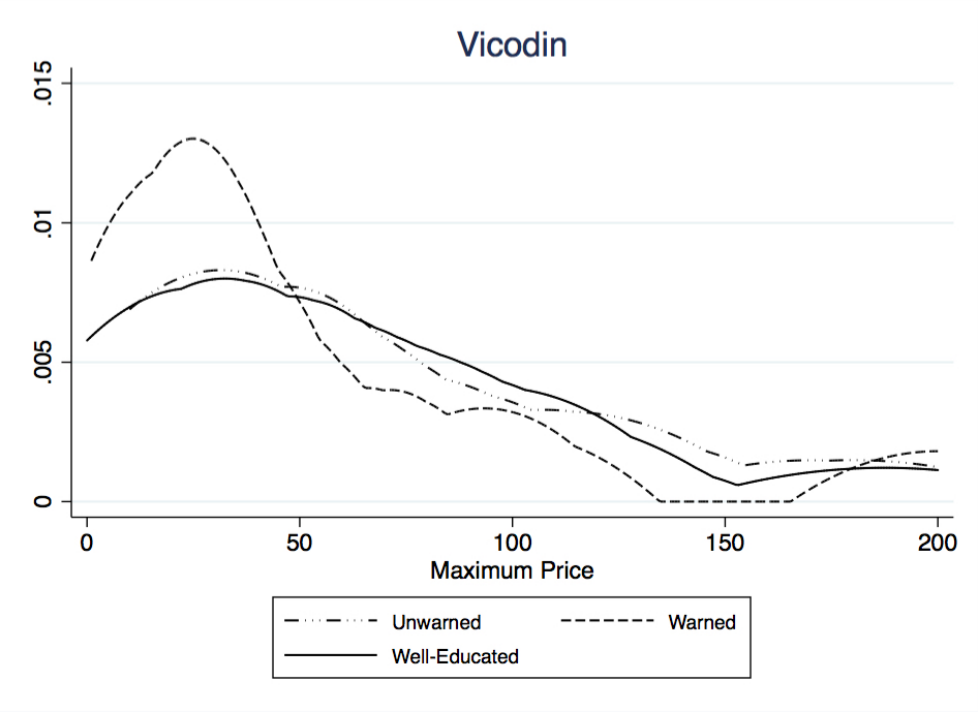
This scenario is instructive for interpretations of other results. The attribute of trace levels of arsenic in rice meet the "materiality" test, but many would probably agree arsenic reporting would be bad public policy no matter how carefully the notices were designed.

The warned group was unsurprisingly scared off by the notice that the rice contains arsenic. A just-in-time disclosure rule (without elaboration on the scale of the risk) would cause a large overreaction. The overreaction dwarfs any possible benefit from disclosure.

The Vicodin vignette tested the effects of warnings about the risk of addiction.[117] Our warned group are informed about the possibility of drug dependency, but are given no information about the scale of the risk or the efficacy of alternative treatments. This is consistent with the disclosures that producers of Vicodin make available to doctors and patients in order to conform to FDA regulations.[118] The results hint at the possibility of overreaction based on the distributions of the maximum prices that study subjects were willing to pay, but the differences are not statistically significant:

[117] Text: "You can buy a two-week supply of a drug to help manage pain caused by a broken arm. / NOTICE: This drug can cause an addiction to painkillers. / 10% of people who are prescribed this drug become addicted. Addiction can lead to liver damage, overdose, and in rare cases, death. / When taken properly, the drug is a much more effective treatment for pain than other painkillers.

[118] "WARNINGS. . . Abuse and Dependence: VICODIN, VICODIN ES, and VICODIN HP can be abused in a manner similar to other opioid agonists, legal, or illicit. Psychological dependence, physical dependence, and tolerance may develop upon repeated administration of narcotics; therefore, tehse products should be prescribed and administered with caution." About Vicodin, http://www.vicodin.com/hcp/about-vicodin?cid=ppc_ppd_vcdn_ggl_ppc_3039. We opted for simpler language to improve readability in our survey.




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (38) | $50.00 | 0.0% |
| Warned (37) | $30.00 | 0.0% |
| Well-Educated (40) | $47.50 | 0.0% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

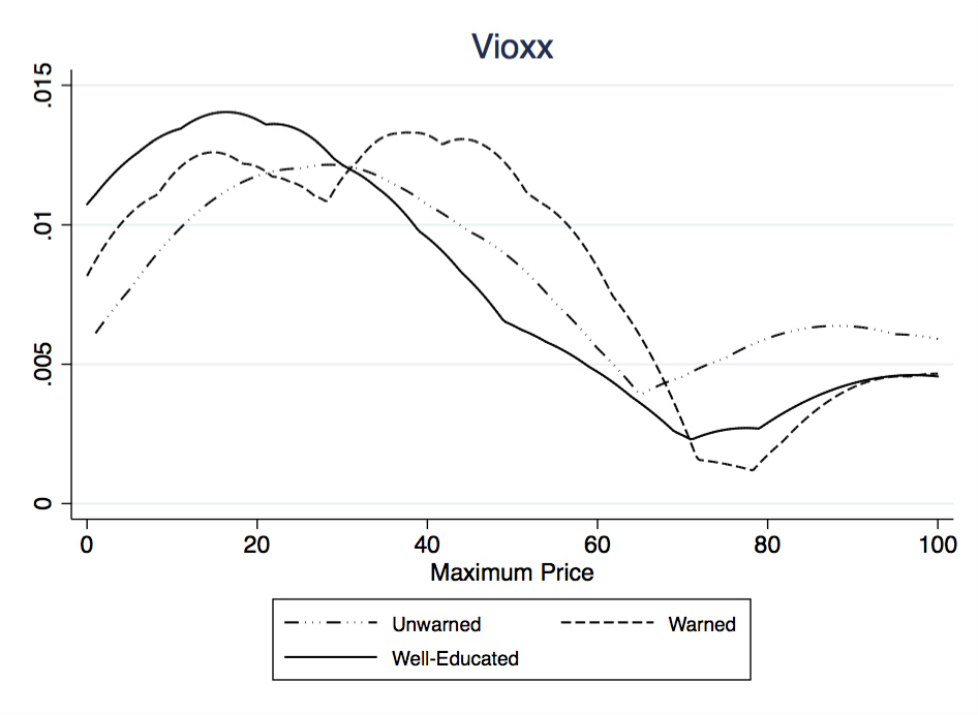
The similarity between the unwarned and well-educated curves is striking, suggesting that for this drug and this side effect, addictiveness is not a material factor. The hump on the left side of the "Warned" distribution suggests that simple drug warnings may indeed cause consumers to be more wary of prescription painkillers than they would if they were better informed about the scale of the risks and the trade-offs. However, the mean log(price) for warned study subjects were not statistically significantly different from the well-educated group.[119]

There is one special factor that affects the willingness to pay for prescription drugs: third-party payers. Because the price of drugs are often

[119] We suspect significance was lost by a few influential subjects who were in the warned group but were nevertheless willing to pay more than $200 for the painkiller. A more powerful study may have found a significant warning-induced overreaction.

paid by insurance companies, study subjects may have had widely varying instincts about how they would price prescription drugs.[120]

For the high risk health scenario, we tested consumer reaction to the drug Vioxx (without using the name).[121] This pain drug was removed from the market in 2004 after a post-market study showed that the drug doubled its user's risk of heart attack and stroke.




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (40) | $67.50** | 0.0% |
| Warned (39) | $40.00 | 7.7% |
| Well-Educated (40) | $27.50 | 7.5% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

Our results show that the increased risk of heart attack and stroke are clearly material factors and that a blunt warning is proportional. In fact, the blunt warning arguably doesn't provide enough notice to consumers

[120] Indeed, a few of our study subjects pointed out that they would normally only pay a co-pay for drugs in our open-ended qualitative question asking subjects what they thought about when setting a price.

[121] Text: "You have the opportunity to buy a drug to help manage pain caused by your arthritis. / NOTICE: This drug has side effects that can increase the chance of heart attack and stroke. / This drug nearly doubles the chance that you will suffer a heart attack or stroke. / This drug has a lower chance of causing ulcers and holes in your stomach than the other available painkillers."

since the well-educated group valued Vioxx even less than the warned group.

We used the results (not reported here) from cohorts who received "Level 2-risk" and "Level 2-benefits" disclosure to drill further into our results. The Level 2-risk and Level 20-benefits groups each had median prices at $30. It seems that educated consumers benefited from the extra information about both the magnitude of the risk (risk of heart attack and stroke doubled using the drug) and about the low trade-offs (since other equally-effective alternatives exist.)

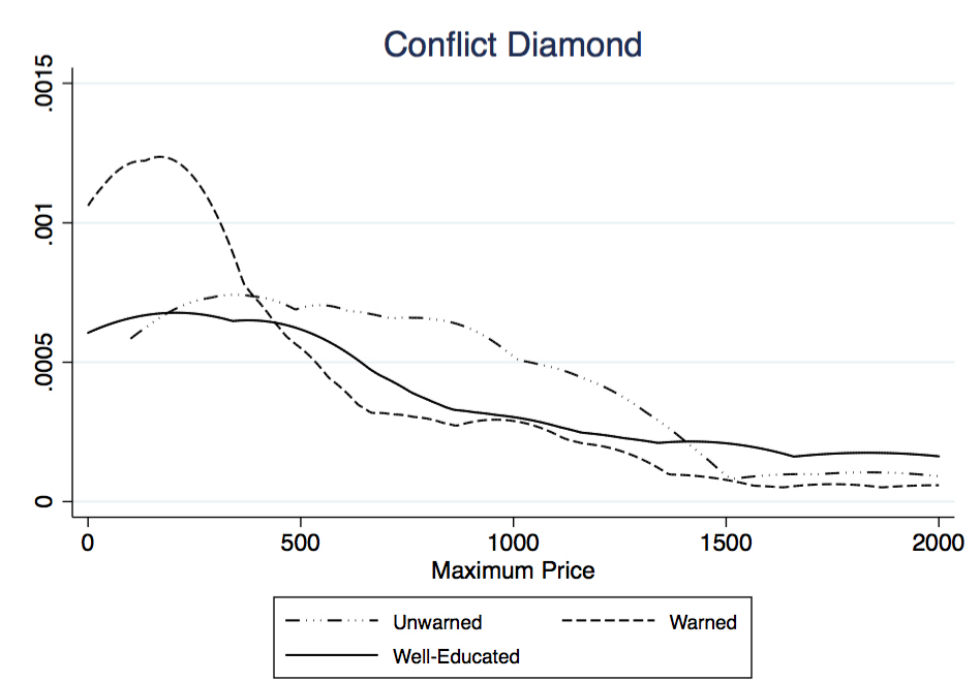
*C. Moral Risks*

Americans are quite accustomed to disclosures about health risks, but social disclosures about the moral consequences of consumption behaviors are rarely compelled by the state. Moral risks do not typically have the shared common value that health risks do since people have different visions of the good and varying priorities. In this way, morality disclosures are more similar to privacy disclosures. We apply our methodology to moral factors in the marketplace not so much to justify the use of mandated disclosure in these areas but to help inform which types of disclosures are suitable for legal compulsion. If moral factors produce results that meet the materiality and proportionality test, they will stand to show that suitability is a crucial third requirement to guide the design of mandated disclosures.

We test two morality scenarios. The first, conflict diamonds, involves a risk of subsidizing an act that many believe to be immoral (civil war).[122] The second, eye drops and animal testing, involves a certainty of subsidizing one.[123]

[122] Text: "You can buy a 2-carat diamond necklace. / NOTICE: This diamond may be a "conflict diamond." The profits may be used to buy weapons used in civil wars in Africa. / Approximately 4% of diamonds offered for sale are conflict diamonds. / The only sure way to avoid supporting armed conflict is to purchase a man-made (cubic zirconium) diamond. With natural diamonds, there is no way to avoid the risk of purchasing a conflict diamond."

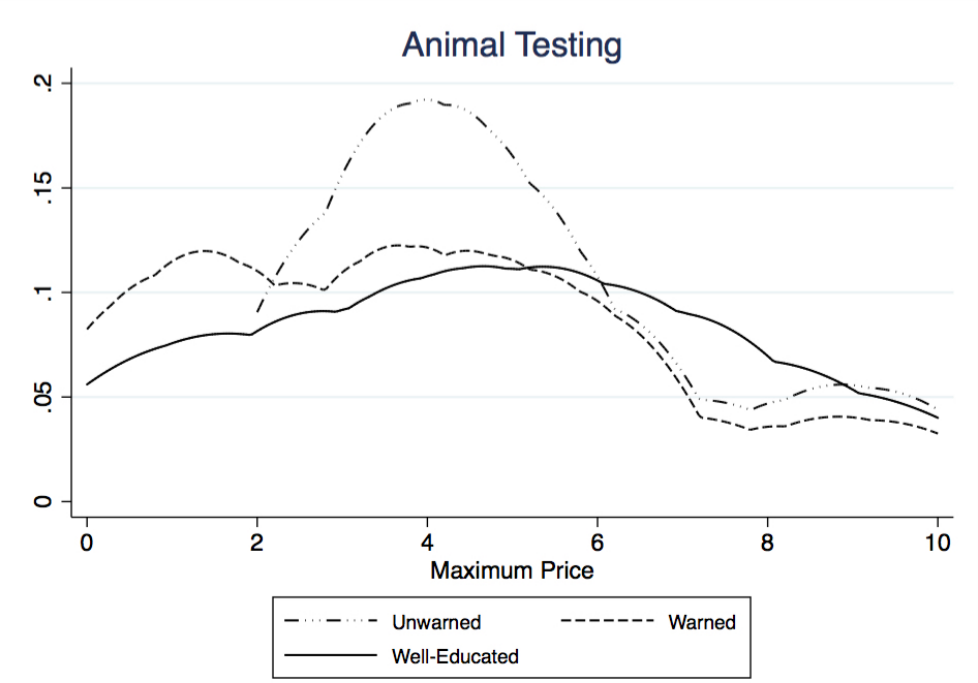
[123] Text: "You can buy a 10 ml bottle of eye drops to treat your dry and itchy eyes. / NOTICE: The manufacturer used animal testing in the process of developing these eye drops. / Scientists placed eye drops with different recipes in the eyes of rabbits. The rabbits were killed if the recipes caused serious eye damage. / The manufacturer used animal testing to meet federal requirements to show that a new product is safe for humans."




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (39) | $800.00* | 0.0% |
| Warned (40) | $300.00 | 12.5% |
| Well-Educated (37) | $500.00 | 2.5% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

The disclosures about conflict diamonds were clearly material. The proportionality of the notice raises some questions since the median reserve price was lower for the Warned group than it was for the Well-Educated group, and since many fewer people in the Well-Educated cohort assigned a value of $0 to the diamond than the Warned cohort. However, neither of these differences was statistically significant. With a larger sample, the notice may prove to be disproportional, but given the data we have, we cannot conclude that the notice is disproportionate. Thus, disclosure about conflict minerals meets the materiality and proportionality requirements. All that remains for the purposes of our policy analysis is the suitability element.




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (39) | $5.00 | 0.0% |
| Warned (39) | $5.00 | 12.8% |
| Well-Educated (39) | $5.00 | 7.7% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

For animal testing, the materiality is lacking, but not by quite as much as our table might suggest. The median prices for all three groups were identical. However, a greater portion of Well-Educated consumers dropped out of the market (7.7%) than the Unwarned consumers (0%), and there was a difference in mean price (as opposed to medians) that was very nearly statistically significant.[124] Nevertheless, with the sample size we have, we cannot conclude that information about animal testing is material. If the attribute had been material, a simple warning would have provided a proportional disclosure because the Educated curve is much more similar to the Warned curve than the Unwarned curve.

The shapes of the curves warrant some attention. Disclosure of animal testing caused consumer divergence. So, although the median stayed the same, consumers were much more spread out from one another once they were made aware that the product had been tested on animals.

[124] Again, statistical significance is calculated based on the natural log of the reserve prices.

Apparently consumers have polarized attitudes about animal testing—some appear to value the product more because it has undergone a specific type of safety protocol while others see animal testing as a detriment. This finding will be relevant to our discussion of suitability. Because the satisfaction of varied preferences is one of the most common justifications for privacy-related and securities-related disclosures, our animal testing results raise doubts about the limits of this sort of reasoning. If varied preferences is alone sufficient to justify a disclosure law, firms should be required to label products that were tested on live animals.

*D. Pseudoscience*

We tested two scenarios in which large subpopulations believe that products expose them to risks despite evidence to the contrary: vaccines[125], and genetically modified foods (GMOs)[126]. Two states currently require GMOs to be labeled as such, and consumers in California are collecting signatures for a petition that would require disclosure of the ingredients in vaccines.[127] However, the Food and Drug Administration counsels against mandated disclosures related to vaccines and GMOs because the reliable scientific evidence shows virtually no evidence of risk from these products while the benefits to health (in the case of vaccines) and to food supply and to the environment (in the case of GMOs) are well-documented.[128] If our model for mandated disclosures is valid, Well-Educated consumers should make decisions substantially similar to Unwarned consumers. Our results

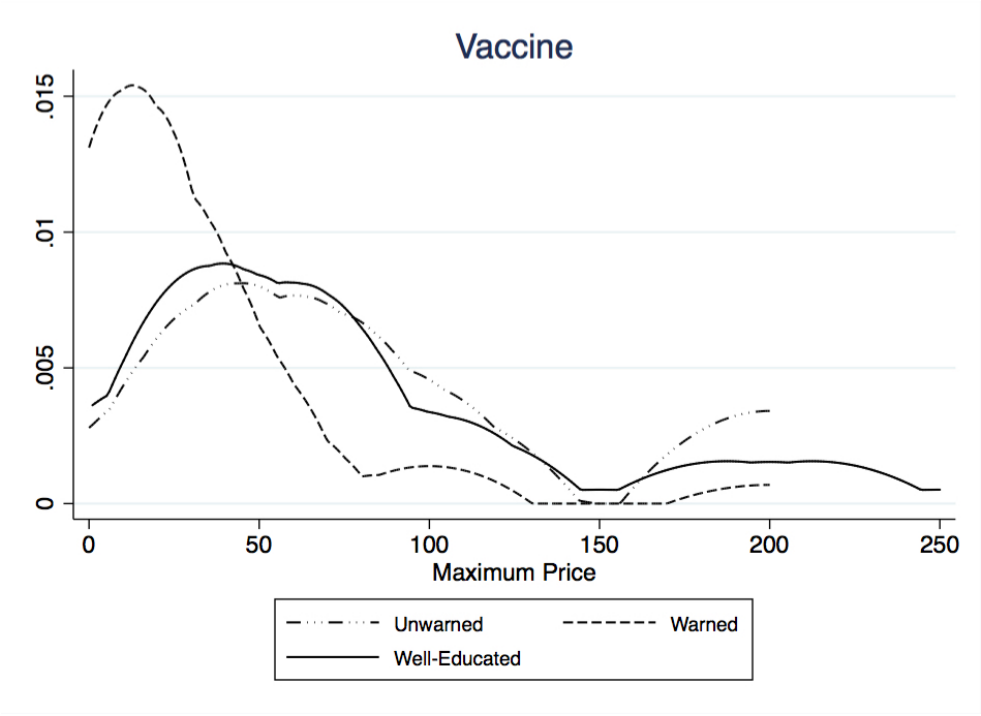
[125] Text: "You can buy a vaccine to protect your child from the flu. / NOTICE: The vaccine contains a mercury-based preservative that some believe can cause autism. / Multiple scientific studies have concluded that there is no evidence that vaccine preservatives cause autism. / The mercury-based preservative is necessary to prevent contamination. When children are vaccinated, they not only protect themselves from getting the flu but also reduce the chance that the flu will spread to children who are too young for the vaccination."

[126] Text: "You can buy two medium-sized zucchinis. / NOTICE: The zucchini is a "GMO." It has been genetically modified to be resistant to certain plant viruses that frequently infect zucchini plants. / There is no reliable evidence that the consumption of GMOs causes any health problems as compared to traditionally bred plants. / The genetic modification protects against viruses that can destroy up to 80% of zucchini crops. Using a non-modified plant reduces the amount of zucchini produced and increases the amount of water and land used for farming."

[127] *See* Facebook petition for vaccine disclosure, https://www.facebook.com/Petition-for-Mandatory-Disclosure-of-Ingredients-in-Vaccines-173063229380902/.

[128] The FDA determined that GMO status is not "material information" for consumers. U.S. FOOD & DRUG ADMINISTRATION, GUIDANCE FOR INDUSTRY: VOLUNTARY LABELING INDICATING WHETHER FOODS HAVE OR HAVE NOT BEEN DERIVED FROM GENETICALLY ENGINEERED PLANTS (2015); Alliance for Bio-Integrity v. Shalala, 116 F.Supp.2d 166, 178 (D.D.C. 2000).

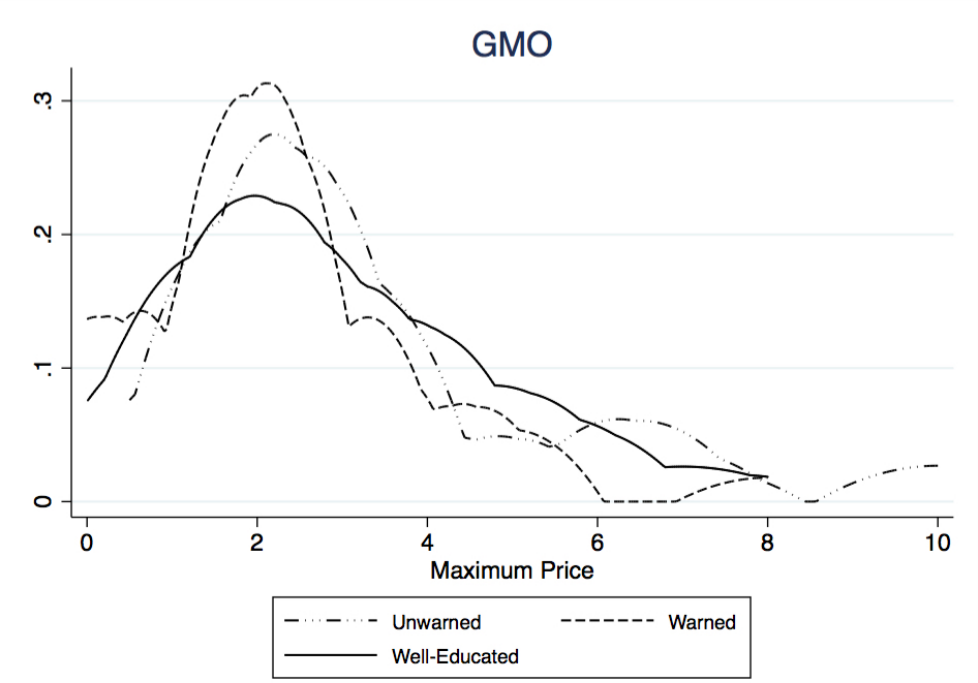
show this to be correct, and also demonstrate that disclosures would cause a harmful overreaction.




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (40) | $75.00 | 2.5% |
| Warned (40) | $20.00*** | 10.0% |
| Well-Educated (38) | $50.00 | 0.0% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

The vaccine results are quite similar to the study of arsenic disclosures in rice. Like that experiment, the Warned group overreacts to simple disclosures about the mercury content in vaccines. Moreover, also like the arsenic experiment, even the Well-Educated group appears to have more reserve for the product than the Unwarned group (although here none of the Well-Educated consumers chose to opt out altogether). Although the differences between the Unwarned and Well-Educated groups are not statistically significant, these results are a good reminder that the education process can still risk distorting decision-making by forcing consumer attention on the suspect attribute.




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (39) | $3.00 | 0.0% |
| Warned (40) | $2.00* | 10.0% |
| Well-Educated (39) | $3.00 | 0.0% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

Results from the GMO experiment were similar. The simple disclosure that the Warned group saw caused an overreaction, including exit from the market. With more information, the median reserve price recovered to the same amount the Unwarned group was willing to pay.

Again we see that even a complete education may have an unwanted effect on consumers. The Well-Educated group had greater variance than the Unwarned group, suggesting that even with complete information, an individual consumer's behavior may change when genetic modification becomes a salient part of the decision-making process. As with animal testing, the diversity in consumers' preferences pose challenges to any theory of mandated disclosure that argues diverse preferences alone justifies mandated disclosure. By that reasoning, GMOs would be a good candidate for mandated disclosure. Under our own theory, however, GMO disclosure is ruled out on two grounds: the attribute is not material, and disclosure is likely to be disproportional.

*E. Privacy*

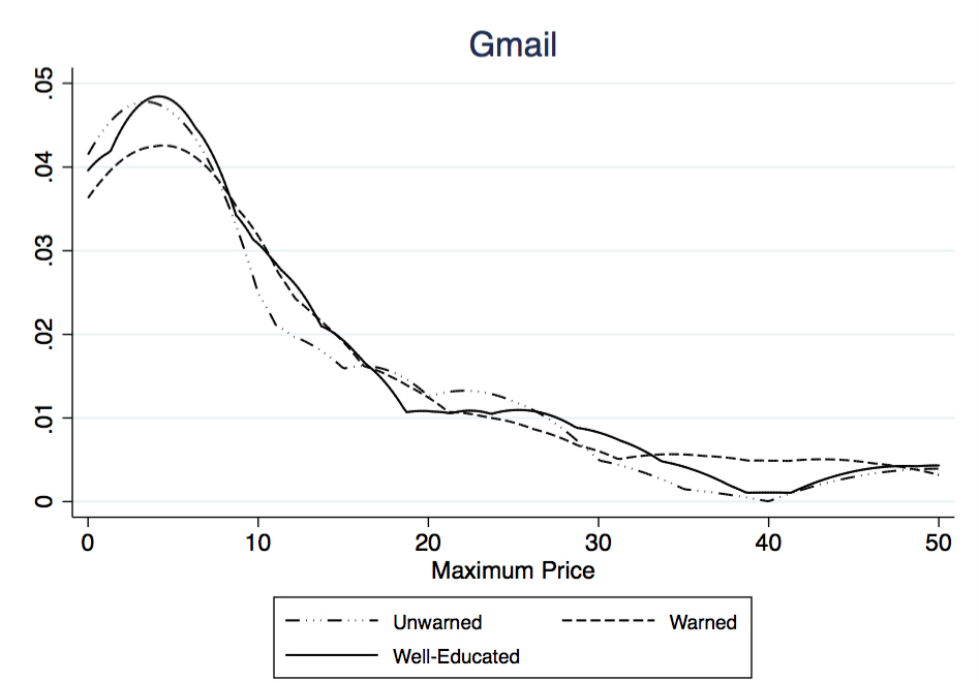
Finally, we tested four privacy-related scenarios. We will begin by assessing whether the scenarios meet the necessary conditions of materiality and proportionality. If the necessary conditions are met, we can then compare those privacy attributes to the others in order to draw some preliminary thoughts about whether mandated disclosure is suitable.

The first two privacy scenarios involve intentional data collection and data sharing by the company.[129] The second set of scenarios involves privacy risks from unintentional data leakage.

For the first scenario, we tested disclosure about an email service's protocol of scanning the contents of emails to serve ads and improve service. The vignette was modeled after Gmail.[130] Although we did not use Gmail by name, we suspect that Gmail's very existence made many survey respondents unwilling to pay anything for an email service.

[129] Our sample sizes for the first set of privacy scenarios is roughly double the size of other scenarios. After our first round of data collection, we collected data on a second cohort to make sure that we were not missing statistically significant reactions to privacy on account of low power. Our results, including the lack of statistical significance, did not change after doubling the sample size. We are therefore more confident about our null results with respect to the privacy scenarios than other scenarios. However, we cannot rule out that the privacy scenarios (and other) are underpowered and would produce significant and meaningful results upon retesting.

[130] Text: "You can buy a service that stores, sends, and receives emails for you online. The service can conveniently be accessed online from any computer. / NOTICE: The company offering this service automatically scans your emails to predict your preferences and to target advertisements to you. / The company will be able to predict a wide range of your qualities and future behaviors. It will not disclose your communications to other companies. / The company uses the scans of your emails and the extra revenues from advertisers to improve the security of your email, to filter out spam emails, and to provide better tools to write and organize your emails."



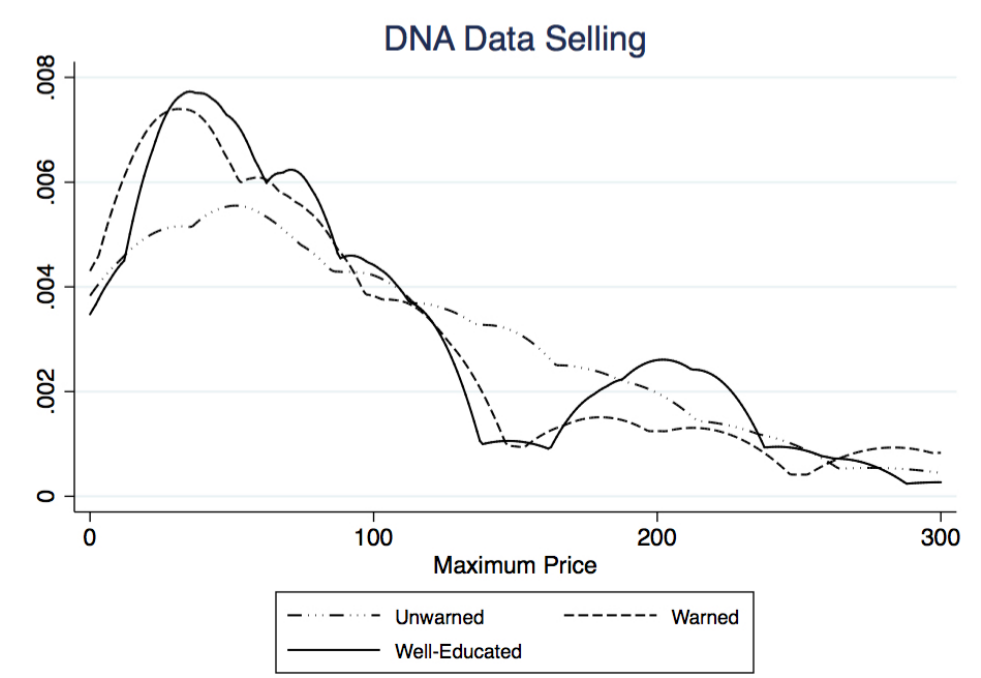

| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (83) | $5.00 | 14.5% |
| Warned (82) | $5.00 | 12.2% |
| Well-Educated (81) | $5.00 | 21.0% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

We find no difference in the willingness to pay between Unwarned and Well-Educated survey respondents. We do find a higher portion of Well-Educated respondents valued the service at $0, but cannot put much stock in this statistic since the portion of $0 valuers in the Warned group was lowest of all. We suspect that many survey respondents recognized that this service is one that they can get without paying anything. This complicates interpretation of the $0 valuers. It could be that better education dissuades people from using the service altogether, consistent with market exit we found in other scenarios. Alternatively, the fully educated group might be interested in the service but believe access to their personal data is payment enough.

The second privacy scenario was modeled after 23andMe. We tested consumer reactions to disclosures about the sale of access by drug companies to the customer's DNA data.[131]

[131] Text: "You can buy a DNA testing service. The service takes a sample of your saliva and creates a profile of your ancestry and your chances of developing certain medical




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (77) | $100.00 | 1.3% |
| Warned (79) | $50.00 | 2.5% |
| Well-Educated (78) | $72.50 | 1.3% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

Again, the tested attribute lacks materiality. The median price for the Unwarned group is higher than the median for the Well-Educated group, but the difference is not significant. (As a reminder, we also found a non-significant difference in the reserve prices for vaccines.) Since we increased our analytical power in this privacy scenario by doubling the number of respondents we surveyed, we have confidence that the median and mean reserve prices are not statistically significant. Moreover, hardly any respondents exited the market by valuing the product at $0. But we also do

conditions. / NOTICE: The company offering this service sells access to its customers' DNA data to drug companies. / Your identifying information is not included in the database that drug companies can access. The drug companies use the data to conduct medical research that may lead to the development of new treatments. / By selling access to the DNA database, this DNA service can afford to offer the testing kit for sale directly to you. Previously, DNA health analysis was available only at a doctor's office."

not see evidence of disproportionality; crude disclosures did not cause a significant overreaction among consumers.

Our results do show that consumers react in polarizing ways to privacy disclosures. The Unwarned group is spread on a single lumpy curve while curves of the Warned and Well-Educated groups are bimodal, consisting of two clusters. It is tempting to justify mandated disclosures on the grounds that consumers have diverse attitudes about privacy and therefore should be able to act on their preferences when making choices about products and services, but there are two infirmities in this reasoning. First, as our GMO and vaccine results show, this same reasoning can be used to justify mandated disclosures about *every* attribute that generates diverse reactions. Second, as the arsenic and shave cream results show, the education process itself may cause distortions. Consumers may focus unduly on privacy (an attribute that on average does not matter to consumers) and fail to weight other attributes appropriately.

We also analyzed how longer privacy policies might affect consumer choices. Google and 23andMe make privacy policies available to their users consistent with Federal Trade Commission recommendations and California law.[132] These privacy policies provide users with more detail about the types of data collected and the conditions under which the company shares its data with third parties. They do not describe the functionality that would be lost if the company were to reduce its collection or dissemination of data—in other words, they provide more detail about the drawbacks but no information about attendant benefits. Indeed, it would be foolish for any company to elaborate benefits since the Federal Trade Commission can use assuaging language in the privacy policy and elsewhere as evidence of false inducement.[133] So we also analyzed study subjects who were exposed to an intermediate level of disclosure.[134] The groups who saw the "risk disclosure" received more detail about the uses of the email scans (Gmail) and the limits on the types of companies that could purchase access to personal data (DNA kit). None of the results differed from those reported above.[135] The privacy policy-style disclosure for the email service resulted in more survey respondents giving the service $0 value than the Well-Educated group, suggesting that detailed privacy

[132] California Online Privacy Protection Act ("CalOPPA"), Cal. Bus. & Prof. C. §§22575-79; FTC RAPID CHANGE, *supra* note 3.

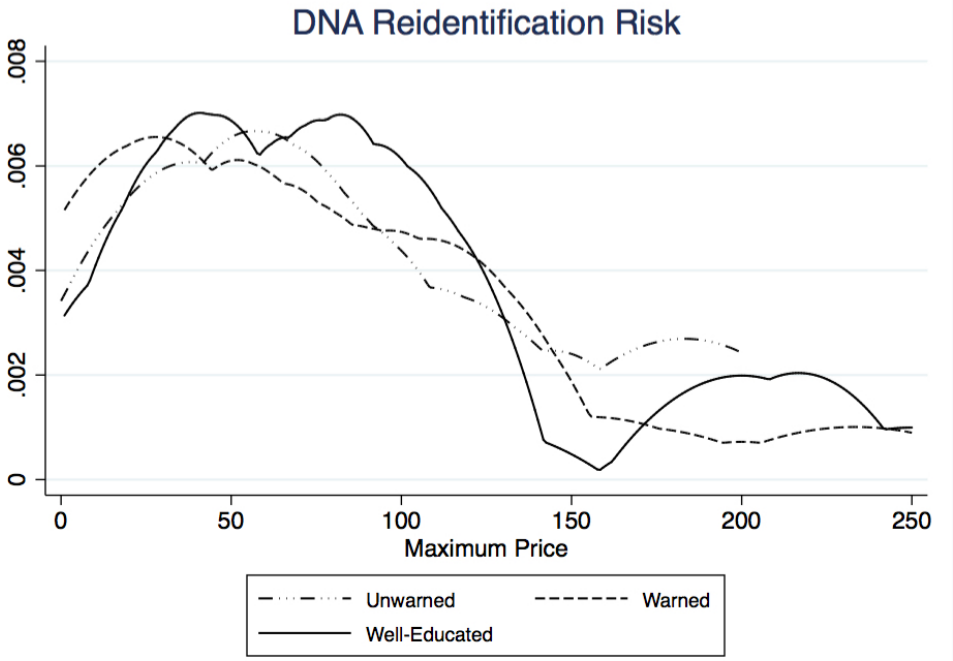
[133] Complaint for Permanent Injunction and Other Equitable Relief, FTC v. Hill, No. 03-5537 (S.D. Tex. 2004) ("False Claim of Need to Provide Information"); Complaint, In re Sears Holdings Mgmt. Corp., FTC File No. 082 3099, No. C-4264 (F.T.C. 2009) ("Insufficient Notice").

[134] In these auxiliary analyses, we included respondents randomly assigned to Level 2-Risk. *See* description of the experiment *supra* page _.

[135] In fact, the intermediate disclosure group for the DNA kit valued the kit more than the well-educated group—a result that is difficult to interpret.

policies may unnecessarily scare off some users. We see these results as further evidence that the materiality of disclosure about data selling and data repurposing is very weak, and that disclosures may mislead consumers into avoiding preferred services.

The next set of privacy vignettes involved risks that the consumer's data may become exposed to third-parties without the company's permission. The first scenario uses the DNA kit again, but this time tests disclosure about the risk that an anonymized database could be reidentified.[136]




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (77) | $100.00 | 1.3% |
| Warned (39) | $99.00 | 0.0% |
| Well-Educated (40) | $87.50 | 0.0% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

[136] Text: "You can buy a DNA testing service. The service takes a sample of your saliva and creates a profile of your ancestry and your chances of developing certain medical conditions. / NOTICE: Although your data is stored without any identifying information, somebody with access to the data might be able to figure out your identity. / The people who will access the DNA database are health researchers. To date, there have been no known malicious reidentification attacks of genomic data. / By retaining the data, the service can conduct research that might lead to new medical and ancestry discoveries."

The risk of reidentification is a contentious topic in the legal and public policy spheres[137], but consumers are not particularly concerned about this risk. We find no significant difference between the Unwarned and Well-Educated groups.[138]

More surprisingly, we find no difference between the Warned and Unwarned groups even though the Warned group saw the ominous message "NOTICE: Although your data is stored without any identifying information, somebody with access to the data might be able to figure out your identity." This suggests that contrary to the great amount of energy that regulators around the world devote to potential risks of reidentification[139], the public is unfazed.

The final scenario involves a security risk based on a vulnerability in Skype's operations that allowed hackers to discover the geolocation of Skype users.[140]

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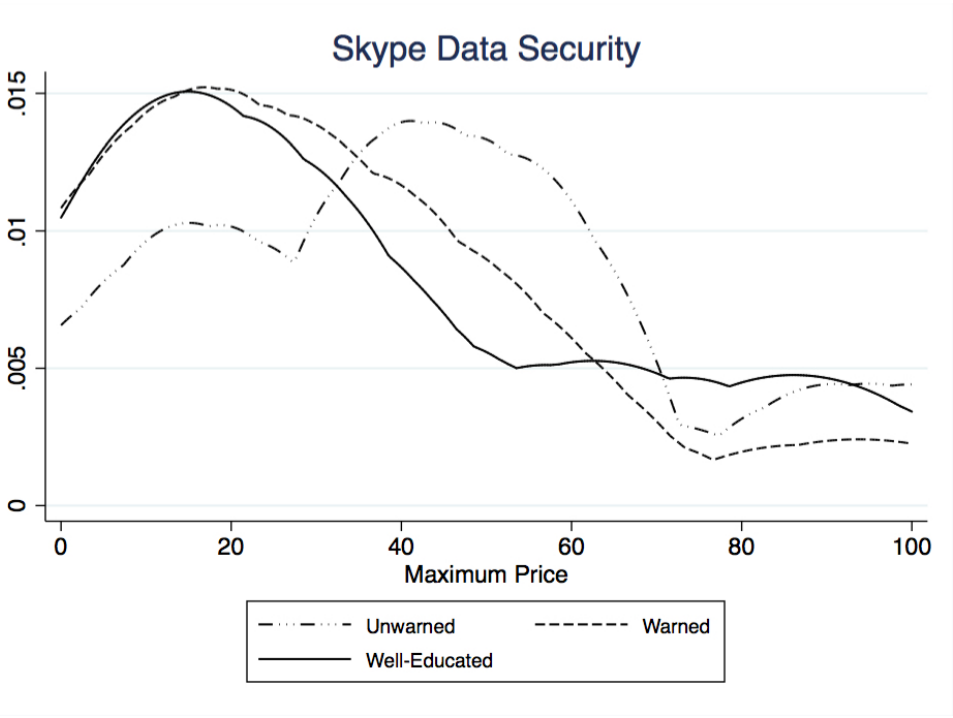
[137] *Compare* Paul Ohm, *Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization,* 57 UCLA L. REV. 1701 (2010) *with* Felix Wu, *Defining Privacy and Utility in Data Sets,* 84 U. COL. L. REV. 1117 (2013) *with* Jane Yakowitz, *Tragedy of the Data Commons,* 25 HARV. J. L. & TECH. 1 (2011).

[138] Moreover, the "no notice" experimental vignette described *supra* in note __ had median values of $100 for both the Well-Educated and Warned groups, and no $0 valuers.

[139] 45 C.F.R. §164.502(d) (HIPAA deidentification rule); Federal Committee on Statistical Methodology, Statistical Policy Working Paper No. 22 (describing deidentification techniques); Joint United Nations Economic Commission for Europe/Eurostat Work Session on Statistical Data Confidentiality (Ottowa, Canada, Oct. 28-30, 2013).

[140] Text: "You can buy a service that makes and receives phone calls for you over the internet. / NOTICE: The service exposes your location data from the last call you made. / A person who wanted to harass you would have to know your account username and where to look for this exposed information. / The service can avoid exposing location data. The quality of the phone calls would have been very slightly lowered."




| | Median Price | Proportion of $0 Value |
|---|---|---|
| Unwarned (39) | $50.00* | 2.6% |
| Warned (40) | $27.50 | 10.0% |
| Well-Educated (40) | $25.00 | 12.5% |

* = statistically significant difference from the Well-Educated group at the 5% level; ** p<.01; *** p<.001.

Here we find that the Well-Educated group valued the service much lower than the Unwarned group, and that the warning had proportional effects. Indeed, the Well-Educated group valued the service lowest of all. Auxiliary research suggests that the benefits disclosure is the reason—when consumers learn how simple it would be for Skype to fix the problem without having much effect on the quality of the phone calls, their value of the product diminishes even further.[141]

## IV. SUITABILITY

Existing research has not adequately explained when disclosure laws are the most appropriate fit for managing varied preferences. Although the government does make frequent use of disclosure regimes to enhance consumer welfare and autonomy[142], in most contexts regulators manage

[141] The subjects assigned to the Level 2-Benefit condition valued the service lowest of all—a median price of $12.99.

[142] Ben-Shahar & Schneider, *supra* note 23 at 647 (describing and critiquing the proliferation of disclosure regulations).

latent risk and variable preferences without disclosure rules. In some contexts (food safety), the government prohibits low quality goods and services to ensure that they are sufficiently safe. In others (kosher, organic, or cruelty-free products), the government relies on market competition to drive out information about an attribute or quality. Still other areas of consumer risk use a hybrid model. Foods follow this model since unsafe foods are kept out of the market and safe ones must comply with a complex set of labeling requirements.[143] Pharmaceutical manufacturers are similar. They are directly regulated through gatekeeping mechanisms to reduce physical risks and are also subject to disclosure rules about the residual risks of side effects.

Our limited range of results from outside the privacy context are somewhat consistent with the federal approach to disclosure about health risks. Trivially small or unsubstantiated risks like GMOs and arsenic in rice are neither directly regulated through prohibitions nor indirectly regulated through disclosure rules because the risks are immaterial and disclosure would cause an adverse overreaction. Large risks such as the doubling of heart attack risk by Vioxx are plausible candidates for disclosure, but may be better off with direct regulatory prohibition (which presumably would have occurred if the manufacturer had not removed Vioxx from the market voluntarily) because even disclosure did not adequately prepare consumers for the large negative side effects and access to safer effective drugs. Where the risks cannot be justified by benefits, where the risks are grossly unreasonable, the government should use prohibition or direct regulation (i.e. through the tort system) rather than disclosure.

The only discrepancy between our findings and the federal approach to health regulation is found in the Vicodin experiment. There we found that the health risks were not material on average, and that simple warnings without sufficient information about scale or tradeoffs could cause patients to overreact. One could argue that the management of health decisions is so universally desired, and so dependent on the particulars of individuals' experiences and body-knowledge, that in this case disclosure serves the important and diverse interests of patients. This model for disclosure may be valid, but it is not the one we adopt in this Article. Under our model, consistent with some contemporary critics of drug disclosure laws, disclosures about medium-sized risks of efficacious drugs are nonmaterial and might cause overreaction.

Our findings on pseudoscientific risks suggest that the federal government's approach to vaccine and GMO health risks are appropriate.

[143] U.S. FOOD & DRUG ADMINISTRATION, GUIDANCE FOR INDUSTRY: VOLUNTARY LABELING INDICATING WHETHER FOODS HAVE OR HAVE NOT BEEN DERIVED FROM GENETICALLY ENGINEERED PLANTS (2015).

Our results support the FDA's refusal to mandate disclosure of GMOs and vaccine ingredients. Disclosures of these sorts would be harmful for the same reasons that disclosure of arsenic in rice is harmful.

The approach to moral risks is more ambiguous, but our findings are arguably consistent with the compelled speech doctrine cases finding that mandatory disclosure of conflict materials are overly ideological. When simple disclosures cause overreaction (which they did to some extent in our animal testing and conflict diamond experiment), the government may be inappropriately nudging its way to a result using a poor education scheme even though the American public does not share a common value for the attribute.

Privacy scenarios share some features with the pseudoscience and moral disclosure cases that should raise some doubts about the suitability of mandated disclosure. First, three out of four of our privacy scenarios failed the preliminary qualifications of materiality. The practice of scanning email content, deidentifying and sharing data, and selling data to third parties are topics that receive significant amounts of attention and comment at the Federal Trade Commission, but consumers show a consistent lack of interest even when facing a simple and ominous warning about the risk. Thus, just-in-time disclosures (or any other form of disclosure) about this attribute would be wasteful. Our findings flatly conflict with the widely accepted philosophy that every company should disclose its data practices.

The last privacy scenario—a data security problem with Skype—met the threshold burdens of materiality and proportionality. Nevertheless, we suspect that data security problems are better managed through direct regulation. For sensitive data, there are some practices (such as data encryption) that are so cost-effective that consumers should not be given the freedom to opt for insecure services. Meanwhile, lay consumers have little capability of understanding the finer technical distinctions between generally accepted security protocols. Consumer choice is a low priority since security is not an attribute that usually satisfies strong, settled consumer preferences. Thus, although mandated disclosure following data breaches has done some work shaming companies into improving their data security practices, direct regulation can more efficiently force companies to internalize externalities from poor security without forcing consumers to manage and worry about security.[144]

Even putting aside the materiality element, the suitability of privacy disclosures prompts a host of philosophical questions that have been

[144] J. Howard Beales & Timothy J. Muris, *Choice or Consequences: Protecting Privacy in Commercial Information*, 75 U. CHI. L. REV. 109, 134; Derek Bambauer, *Cybersecurity for Idiots* (unpublished manuscript).

glossed over in the literature. On one hand, our findings are consistent with the public policy arguments of Daniel Solove, Lauren Willis, and others who insist that consumers should be alerted about privacy practices because we lack a social consensus about appropriate collections and uses of personal information.[145] Our distributions on consumer willingness to pay support the observation that consumers have widely varying preferences about the sale of their personal genome data. The second moments (the standard deviations, or the spread of the distribution curves) tell this story. When survey respondents were fully educated about the personal data practices of the DNA kit manufacturer, the median and mean willingness to pay did not change significantly, but the respondents were spread wider and bi-modally across the spectrum. Thus, one could conclude (as Willis has) that consumers need to know about privacy practices so that they can appropriately evaluate their personal true costs of the product.

The trouble is, Willis's rule for suitable disclosure would have unlimited application. If we demand disclosure for all latent features about which we have no social consensus, mandated disclosure will proliferate at a much faster clip than it has in the past. For example, using just the small set of scenarios we tested here, GMOs, animal testing, mercury in vaccines, and even the presence of Laureth-4 would have to be found suitable for disclosure since the variance in responses among the Well-Educated groups differed from the Unwarned groups.

We could conceivably overcome the boundlessness of Willis's approach by recognizing suitable disclosure regimes when well-educated consumers have widely varying preferences *and* when consumers are very enthusiastic about mandated disclosure. Our analysis of survey respondents' desire for mandated disclosure (not reported here) found that a vast majority of survey respondents wanted mandated disclosure across all scenarios and all disclosure levels, but desire was particularly high (over 90%) for the health risk and privacy scenarios. However, this formulation also has flaws. First, there is path-dependency. We suspect many of our survey respondents have come to take the existence of privacy policies and the laws that require or strongly encourage them for granted, and would not want to lose access to this information. Second, we fear that public intellectuals and the government itself would have outsize influence on public support for disclosure.

Another possibility, which we find more plausible, is that Willis got the premise precisely backwards. It may be that mandated disclosure is suitable only for attributes for which there *is* social consensus—attributes for which the risks that require some management and tradeoffs are

[145] Willis, *supra* note 33 at 1351.

unambiguously bad. This formulation of suitability would cover disclosures about health risks. And although we did not test them, disclosures about financial risks of certain sorts (such as retirement savings) may also have a common value. Privacy, on the other hand, would be no more suitable for compelled disclosure than ideological disclosures about sweatshops, animal testing, vaccines, and GMOs.

## V. OBJECTIONS AND LIMITATIONS

In this part, we address three objections that can be raised about discretionary choices in our experiment and about the underlying theory. First, readers may be concerned that the disclosures and statements we drafted for our "warned" and "well-educated" survey respondents are inaccurate and likely to bias results. Second, some may have concerns about our generalizing about all privacy disclosures from the discrete set of privacy practices that we tested. And third, readers may doubt our theoretical model by arguing that disclosure laws will induce rational firms to provide more information than the law requires, thereby raising all consumers to the "well-educated" level. Each of these critiques might have merit in specific instances, but they do not undermine the contributions of the project as a whole. We will consider each in turn.

### *A. Your Facts Are Not Right*

We tried to draft our descriptions of the risks and benefits of our chosen attributes to avoid controversy, but it is entirely possible that we failed in some respect. We invite others to replicate our methods and examples with generally accepted facts to see whether our results are robust.

Similarly, our instrument may suffer from framing effects that could have biased results despite our efforts to avoid them.[146] Because our analyses involve between-subject comparisons with similar frames, and because we do not take any responses at face value, we are not overly concerned about framing effects, but again we invite further study that can contribute to our theory or challenge it.

To some extent, the particulars of our tested scenarios are beside the point. This work provides a proof of concept for our model of politically responsible mandated disclosures. Even if readers do not believe we have

[146] Responses to disclosures are susceptible to framing and cognitive biases. For example, Adjerid et al. show that people are more willing to disclose personal information when a privacy policy is described as an increase in privacy protection from the previous state, even when the actual policies are the same. Adjerid et al., *supra* note 15. We acknowledge that the drafting of our vignettes were the product of discretion and may engage different cognitive across vignette scenarios, complicating our comparisons.

accurately described the practices of Google or 23andMe, the larger point is that a company *could* operate in the way we describe, and that disclosure could cause a severe overreaction that undoes any value a disclosure law could add to public welfare.

### *B. You Did Not Test the Worst Privacy Scenarios*

Some readers may protest our selection of privacy scenarios because they do not include the most intrusive or abusive privacy practices, such as the collection, aggregation, and sale of personal data to literally any company that is willing to pay for it. After all, this is how data becomes available to a wide range of marketers, credit scorers, and potential employers.

It is true that we selected privacy practices for our study that were more contained than the practices that amass large amounts of personal data and loose them on the world. However, we did select the DNA data sale scenario because it has many of the features that scholars and the public find most creepy. It involved highly sensitive data (the entire genome sequence of customers), commercialization (sale to companies), and a reviled industry (Big Pharma). Even this scenario received tepid responses from our survey subjects, leading us to the skeptical position we presented in the last Part. Indeed, our findings were especially surprising because Mechanical Turk survey respondents are known to be much more concerned about privacy than the general public[147], meaning our results probably exaggerate true attitudes.

However, there are many privacy-related data practices that we did not test, and we cannot speculate what the results would have been if we had. For example, we did not test how consumers would respond to disclosures about a firm's cooperation with law enforcement by providing the personal data of its customers.[148] Even if we could correctly describe the scale and practical consequences (both positive and negative) of these practices, which is doubtful, the results would have little relevance to contemporary policy debates because law enforcement agencies would strongly resist any mandatory salient, just-in-time disclosure requirements.

We also decided against testing disclosure about the collection and broad dissemination of less-sensitive data because these practices have an

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[147] Matthew B. Kugler & Lior J. Strahilevitz, *Surveillance Duration Doesn't Affect Privacy Expectations: An Empirical Test of the Mosaic Theory,* _ SUP. CT. REV. _, _ n. 208 (forthcoming 2016) (describing the large differences in responses to the same privacy survey to a nationally representative sample and a sample of Mechanical Turk survey respondents).

[148] Kimberly Brown, *Outsourcing, Data Insourcing, and the Irrelevant Constitution,* 49 GA. L. REV. 607 (2015); Kiel Brennan-Marquez, *Private Dragnets* (unpublished manuscript); Jane Bambauer, *Other People's Papers,* 94 TEX. L. REV. 205 (2015).

overly complex cost-benefit calculus. It would be very difficult to describe the lost functionality and lost benefits in an alternative world where data is not routinely repackaged and sold in a way that was faithful to the real world. First, in this alternative world, consumers would lose a lot of Internet content that is currently tacitly underwritten by advertisers and data aggregators. Second, the use of personal data by creditors, employers, and advertisers that seems so inappropriate actually produces many positive effects for the very consumers who resent it. Credit is extended more cheaply and accurately—meaning that low-income applicants benefit while high-income credit risks lose out. Price discrimination too, to the extent it can happen, can benefit lower-income shoppers who receive discounts while causing higher income buyers to pay more.

To be clear, there is evidence that the data-driven ecosystem can cause racial bias (even when it is not intentional.)[149] But it isn't at all clear that the dominant effect on racial minorities and the poor is negative since other studies about more consequential outcomes such as wages and access to credit find a net benefit for these groups.[150] For these reasons, we avoided testing scenarios for which the attendant risks and benefits are highly contested.[151]

### *C. If the Government Mandates Disclosure, Firms Will Provide the Rest of the Education*

Finally, some may object that the premise of our model is flawed by wrongly assuming that firms will provide only the blunt, simplified disclosures mandated by law without adding detail about the scale of risk or the attendant benefits of an attribute. In other words, even a bad disclosure rule could prompt firms to give consumers a fulsome education that brings them closer to our Well-Educated cohort.

We think this is implausible. First, a fulsome education is difficult for the very same reasons recounted in the last subpart. The positive effects of massive data sharing and Internet advertising underwriting cannot be explained well in a short amount of space. They run so counter to intuition that the task would be difficult in longer privacy policy documents. It is

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[149] Latanya Sweeney, *Discrimination in Online Ad Delivery,* 56 COMM. OF THE ACM 44 (2013); Solon Barocas & Andrew D. Selbst, *Big Data's Disparate Impact,* 104 CAL. L. REV. __ (forthcoming 2016).

[150] James C. Cooper, *Separation, Pooling, and Predictive Privacy Harms from Big Data: Confusing Benefits for Costs?*, GEO. MASON L. STUD. RESEARCH PAPER NO. LS 15-15 (2016) (credit); Lior J .Strahilevitz, *Privacy versus Antidiscrimination*, 75 U. CHI. L. REV. 363, 371 (2008) (wages); Jane Bambauer, *The New Intrusion*, 88 NOTRE DAME L. REV. 205, 268-270 (2012) (credit).

[151] *See* Lior J. Strahilevitz, *A Positive Theory of Privacy Law,* 126 HARV. L. REV. 2010 (2013).

simply impossible in the context of just-in-time disclosure. Better to just deflect attention away from the overly negative disclosures, as firms routinely do.

Second, as we mentioned in Part II, regulators often create strong disincentives for firms to defend their practices or assuage their customers by reviewing statements holistically and construing ambiguities against the company.[152] This is particularly true for privacy policies. The FTC discourages statements about benefits by requiring firms to get express consent before making changes to the way it uses data[153], so statements of benefits could add significant burdens to companies in the future if the nature of the benefits change. The FTC can also interpret counterbalancing statements as deceptively luring consumers into a false sense of security.[154] To illustrate what the FTC has in mind for an appropriate disclosure, consider the statement it provided for its own "Talk to Us" link on the FTC.gov website:

> You can contact us by postal mail, telephone, or electronically, via an on-line form. Before you do, there are a few things you should know.
>
> The material you submit may be seen by various people. We may enter the information you send into our electronic database, to share with our attorneys and investigators involved in law enforcement or public policy development. We may also share it with a wide variety of other government agencies enforcing consumer protection, competition, and other laws. You may be contacted by the FTC or any of those agencies. In other limited circumstances, including requests from Congress or private individuals, we may be required by law to disclose information you submit.
>
> Also, e-mail is not necessarily secure against interception. If your communication is very sensitive, or includes personal information like your bank account, charge card, or social security number, you might want to send it by postal mail instead.[155]

Finally, as a descriptive matter, corrective counterstatements are rarely done. Privacy policies, drug labels, and other disclosures hue closely

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[152] FEDERAL TRADE COMMISSION, FTC POLICY STATEMENT ON DECEPTION 3 (1983) ("To be considered reasonable, the interpretation or reaction does not have to be the only one. When a seller's representation conveys more than one meaning to reasonable consumers, one of which is false, the seller is liable for the misleading interpretation.").

[153] FEDERAL TRADE COMMISSION STAFF REPORT: SELF-REGULATORY PRINCIPLES FOR ONLINE BEHAVIORAL ADVERTISING 47 (2009).

[154] CHRIS HOOFNAGLE, FEDERAL TRADE COMMISSION PRIVACY LAW AND POLICY 159-66 (2016); Solove & Hartzog, *supra* note 20.

[155] OFFICE OF MANAGEMENT AND BUDGET, GUIDANCE AND MODEL LANGUAGE FOR FEDERAL WEBSITE PRIVACY POLICIES (June 1, 1999) (available at https://www.whitehouse.gov/sites/default/files/omb/memoranda/m99-18attach.html.)

to the set of information that is required.[156] So whether we have hit on the reasons that firms avoid educating consumers about the tradeoffs involved with the suspect attribute or whether there is some other explanation, the track record strongly suggests that firms will not improve on the government's flawed lesson plan.

## V. CONCLUSIONS

This Article has attempted to add precision and concrete examples to the theory of mandated disclosure. We have shown that disclosures can make consumers worse off by causing harmful overreaction. When the overreaction caused by mandated disclosure outweighs its benefits, the government pushes consumers to make decisions that are inconsistent with their preferences. These bad education regimes operate as a covert and manipulative form of regulation.

We offered a model that differentiates good consumer education regimes from bad ones by incorporating the concepts of materiality, proportionality, and suitability. After validating our model using experimental results about health, morality, and pseudoscience disclosures, we applied it to privacy and found that in most cases, privacy disclosures are either useless or worse than useless by inducing consumer panic without explaining the added benefits and functionality that result from the privacy violations.

Finally, our experiment casts doubt on the popular justification for privacy disclosures. It is tempting to explain mandated privacy disclosures on the basis that they promote autonomy by allowing consumers with widely varying preferences to find the products and services that best fit their particular priorities. The trouble is, a boundless number of mandated disclosures could be justified by this rationale. This guiding principle would mandate disclosure about animal testing and GMOs, and even the presence of mercury in vaccines.

We conclude that mandated disclosure laws cannot be justified on the basis of consumer diversity alone. Instead, mandated disclosures must provide a suitable and proportional notice about a material attribute. Otherwise, regulators can impose costly disclosure requirements and nudge consumers to take actions that contradict their preferences under the false pretense of satisfying consumer wishes.

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[156] There are some exceptions. For example, Apple's iOS 6 now allows app developers to explain why the collect the personal data that they do, and users are much more likely to download an app when the app developer takes the trouble to do so. Joshua Tan et al., *The Effect of Developer-Specified Explanations for Permission Requests on Smartphone User Behavior*, PROC. OF THE SIGCHI CONF. ON HUMAN FACTORS IN COMP. SYS. 91 (2014).