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STRUCTURAL RIGHTS IN PRIVACY

Harry Surden*

This Essay challenges the view that privacy interests are protected primarily by law. Based upon the understanding that society relies upon non-legal devices such as markets, norms, and structure to regulate human behavior, this Essay calls attention to a class of regulatory devices known as latent structural constraints and provides a positive account of their role in regulating privacy. Structural constraints are physical or technological barriers which regulate conduct; they can be either explicit or latent. An example of an explicit structural constraint is a fence which is designed to prevent entry onto real property, thereby effectively enforcing property rights. Latent structural constraints, by contrast, are the secondary costs arising from the technological state of the world which implicitly regulate conduct by making certain activities too difficult to engage in on a widespread basis.

Society relies upon these latent structural constraints to reliably inhibit certain unwanted conduct in a way that is functionally comparable to its use of law. For example, society has frequently depended upon the search costs involved in aggregating and analyzing large amounts of information to effectively protect anonymity. The operation of these latent structural constraints is often implicit and therefore non-obvious to policymakers. This focus on implicit, rights-like relationships which are protected by non-legal constraints becomes significant because latent structural constraints are vulnerable to sudden dissipation due to emerging technologies. This Essay describes a conceptual framework by which policymakers can explore this association between constrained behavior and latent structural constraints and suggests that they employ this conceptualization in order to identify non-obvious privacy interests which may be threatened by emerging technologies.

I. INTRODUCTION

IN this Essay, I generalize the logic underlying legal rights in order to question the view that privacy is protected primarily by law. In the traditional view, privacy rights are those positive legal rights which

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have been explicitly identified and instantiated by rule-makers.¹ Viewing the domain of privacy interests as coterminous with legal interests omits a large category of significant but non-obvious privacy interests which are regulated by other mechanisms. Importantly, from a public policy perspective, the choice of regulatory mechanism can have an impact on the substantive quality of the regulated interest.

As the recent literature has observed, law is not the only means through which society regulates human behavior.² Besides law, society shapes the conduct of individuals using, among other devices, norms, markets, and the real-world physical and technical limitations known collectively as *structure*.³ These are the so-called *non-legal* regulatory devices. Although they are different in nature, these various mechanisms share the common attribute that they constrain behavior by regulating the costs of certain activities.⁴ In many instances, these regulatory devices can be used interchangeably or in parallel for the purpose of achieving the same regulatory goal.⁵ Law, therefore, can be seen as just one instance of a class of constraint mechanisms that regulate behavior by adjusting the cost of certain behaviors.

Legal theorists following Wesley Hohfeld have defined an individual legal right in terms of a legal duty on the part of others to refrain from particular behavior relative to the rights-holder.⁶ In other words, a legal right is created whenever a legal constraint prevents others from engaging in particular behaviors with respect to the rights-holder.⁷ Combining this definition with the observation that society often relies upon regulatory devices not rooted in law in order to constrain unwanted behaviors,

1. See, e.g., Daniel J. Solove, *Privacy and Power: Computer Databases and Metaphors for Information Privacy*, 53 STAN. L. REV. 1393, 1430 (2001) ("Privacy law consists of a mosaic of various types of law: tort law, constitutional law, federal and state statutory law, evidentiary privileges, property law, and contract law.").

2. See, e.g., Edward K. Cheng, *Structural Laws and the Puzzle of Regulating Behavior*, 100 NW. U. L. REV. 655, 657 (2006); Lawrence Lessig, *The New Chicago School*, 27 J. LEGAL STUD. 661, 662 (1998).

3. See LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 82–83 (1999) (discussing how human behavior is moderated by other mechanisms besides law). A fence is an example of a structural regulator. Rather than relying upon trespass law to keep unwanted visitors from one's land, landowners often rely on the physical regulation that a tall fence imposes. Lessig uses the term "architecture" to describe real-world limitations on human behavior. *Id.* I will use the term "structure" instead, because I believe that the term "architecture" might suggest intentional human design. The term "structure" encompasses regulators which are both the by-product of design and the by-product of the state of the world.

4. This Essay focuses upon the cost-imposing, rather than the cost-reducing (subsidy) aspects of regulatory devices.

5. See Lessig, *supra* note 2, at 686.

6. See Wesley Hohfeld, *Some Fundamental Legal Conceptions as Applied in Judicial Reasoning*, 23 YALE L.J. 16, 30–32 (1913). In Hohfeld's conception, one holds a legal right when there is a general legal duty that others in the world refrain from certain behavior that either interferes with some affirmative activity (a positive right) or takes away from some activity (a negative right).

7. This focus of this Essay is the Hohfeldian negative right—the duty to refrain from a particular behavior—rather than a positive right—the duty to engage in particular behaviors.

this Essay makes the point that under certain circumstances, this “right by way of constraint” relationship can be generalized and applied to the non-legal regulatory mechanisms as well.

In particular, whenever society appears to rely upon a non-legal constraint mechanism to reliably prohibit unwanted behavior *in the place of and as a substitute for an explicit law*, it is useful for policymakers to query whether the non-legal constraint is implicitly protecting a “constraint-right”.⁸ This constraint-right conceptualization is an analytical aid for reifying the explicit legal right that would have existed had society chosen to use the legal regulatory mechanism to constrain the behavior. This general schematic forms the basis of a paradigm that I call the constraint-rights framework.

It is analytically helpful to think about the relationship between non-legal regulators and constrained behaviors using the idiom of legal interests. Legal rights and the behaviors constrained by legal rules are explicit and expressive.⁹ By contrast, the regulation of behaviors through non-legal mechanisms is often implicit and non-obvious.¹⁰ The constraint-rights conceptualization highlights this relation between constraint and behavior. In essence, the framework poses a thought experiment to policymakers to expressly consider whether the implicitly regulated interest merits explicit regulation. This is especially important when there is a risk that the non-legal regulator will suddenly cease to inhibit the behavior.

In the privacy context, society implicitly relies upon non-legal regulators to prevent a large number of unwanted behaviors. Although positive legal privacy rights are relatively easy to identify because they are enumerated in statutes and judicial doctrines, potential privacy interests protected by non-legal mechanisms may not be apparent to policymakers. By the time these implicit rights-like relationships come to light in the public discourse, it is often because these interests have already eroded. Such interests tend to dissipate for the reason that not all constraint mechanisms are equally effective at reliably preventing unwanted behavior due to their relative dependence on external factors. In particular, this Essay focuses on privacy interests that are governed by structural constraints and the corresponding “structural privacy rights” which they may be protecting. Structural constraints are regulators of behavior that prevent conduct through technological or physical barriers in the world. These barriers make certain conduct costly.¹¹ It is helpful to divide structural constraints into two categories—explicit and latent. To the extent that these structural constraints are simply by-products of the technologi-

8. I use the term “society” here in a generic sense, referring to actions of formal or informal institutions of public governance.

9. Cheng, *supra* note 2, at 659.

10. *Id.* at 662.

11. This Essay builds upon important insights from the existing privacy literature in order to create a general conceptual framework to describe this dynamic. See LESSIG, *supra* note 3, at 142–63 (providing some of the most important insights in this regard).

cal or physical state of the world, rather than the result of design, they are *latent* structural constraints.¹² The suite of behaviors that are permitted and prohibited by latent structural costs given the default state of the world can be thought of as conceptually similar to an initial distribution of legal entitlements.

Importantly, latent structural constraints can lose their regulatory capability gradually due to exogenous factors, such as the emergence of new technologies. This renders privacy interests which are solely protected by latent structural constraints—so-called *structural privacy rights*—more vulnerable to erosion than comparable legal rights.

In the second part of this Essay, I develop the constraint-rights framework in order to provide a vocabulary for exploring the puzzle of eroding privacy interests. It flows from the arrangement in which there is a societal assumption that certain behaviors are reliably constrained by alternative regulators—such as structure—without need for explicit, legal rules to moderate the conduct. I suggest that if policymakers adhere to the conventional view in the privacy domain that privacy rights are coextensive with the set of explicit privacy laws and doctrines enumerated by legal rule-makers, then they may be omitting a significant source of privacy interests from the public debate. This has implications upon the question as to what policymakers should consider to be an existing privacy interest in the event that latent structural constraints that society had been reliant upon suddenly fail to adequately inhibit a particular behavior.

I also explore the major constraint mechanisms—laws, markets, norms, and structure—across various characteristics that shape their ability to regulate or prohibit behavior. In this way, I consider why some regulatory devices tend to be employed more than others in domains such as privacy, where it is important to prevent rather than incrementally regulate unwanted conduct. I also discuss how these characteristics result in sudden, discontinuous drops in regulation upon the dissipation of structural constraints.

Finally, I closely examine the important role of latent structural constraints in privacy law, providing a positive account of the recurring phenomenon of eroding interests and emerging technologies. This is what I term the “structural rights/emerging technology dynamic.” I emphasize the way in which latent structural constraints—which are premised upon cost inhibiting actions—are vulnerable to erosion by particular emerging

12. A simple example will illustrate the point. In today's world, there is an expectation that the contents of a closed bag will be private from onlookers. This expectation is based upon the assumption that others cannot, from a distance, discern the contents of a closed bag given the technological state of the world. Structural constraints—the physical and technological costs imposed by the current state of the world—can be seen as constraining the conduct. Assuming that such behavior is socially undesirable from a privacy perspective, society would not need to explicitly prohibit this behavior using the legal regulatory device. The structural constraint of cost serves as an adequate constraint on the unwanted behavior.

technologies that lower those inhibiting costs. To the extent that society depends upon the presence of these costs to reliably inhibit a potential privacy-violating activity, their dissipation results in a sudden regulatory shift, leaving these interests unprotected. This framework can be used to describe similar phenomena in other areas of law governed by latent structural constraints and subject to emerging technologies, particularly in the realm of intellectual property.

In Part III of this Essay, I illustrate this dynamic between structural privacy interests and emerging technologies in the context of a contemporary privacy debate surrounding an emerging technology known as Radio Frequency Identification (“RFID”). Using RFID as an illustrative vehicle, I examine a series of potential privacy interests that are protected solely by latent structural constraints. The main conceptual point is that the diffusion of this emerging technology can be seen as potentially eliminating implicitly regulated privacy interests. Rather than passively allowing the emergence of the technology to effectively cause a shift in entitlements, I suggest that policymakers should closely examine the implicit privacy interests within the conceptual framework outlined in this Essay to expressly determine whether they merit explicit governance by another regulatory device. In particular, because of their vulnerabilities to technology, it is useful for policymakers to identify structural privacy interests before a particular cost-lowering technology becomes too widespread.

In the fourth and final part of this Essay, I present a series of principles for engaging in this identification task. I also explore these principles in relation to the rhetoric of rights. In this, I hope to give a vocabulary to discuss the above-described phenomenon—the potential loss of structural privacy rights. Groups facing the loss of privacy interests which had been implicitly protected by structural mechanisms but which are suddenly threatened by the emergence of new technologies could use the familiar language of rights to highlight this situation in the public discourse.

I also observe that, like laws, structural constraints are both over-inclusive and under-inclusive relative to the behavior they are attempting to regulate.¹³ That is, due to limits in the precision of constraining particular behaviors, structural constraints prevent both unwanted behavior as well as other behaviors that are benign or even desirable. I therefore suggest a means for more precisely targeting the undesirable behavior. In this way, if the scenario arises in which a structural constraint no longer adequately prevents a type of behavior due to an emerging technology, society may choose to utilize an alternative constraint mechanism—such as law—to continue to protect the privacy interest. Based upon the prin-

13. See, e.g., Duncan Kennedy, *Form and Substance in Private Law Adjudication*, 89 HARV. L. REV. 1687 (1976). A speed limit provides a good example of a law being over-inclusive relative to the behavior it is attempting to regulate. If the behavior regulated by a speed limit is “safe driving,” then a sixty-five miles per hour speed limit prevents some behavior at sixty-seven miles per hour which is safe for the sake of administrability.

ciples described, policymakers can target the undesirable behavior precisely, so that a new constraint mechanism does not have to be as over-inclusive as the structural constraint it is replacing. Through this process of precise targeting of behaviors, policymakers can reduce overall social costs by permitting beneficial or benign behaviors while still constraining conduct that is considered to violate privacy.

II. CONSTRAINTS AS REGULATORS

A growing body of legal literature emphasizes the point that there are multiple means by which society regulates human behavior besides law.¹⁴ The concept of alternative behavior regulators extended from initial insights by the law and economics community on the effects of pricing upon behavior.¹⁵ Recent scholars, notably Lawrence Lessig, have highlighted the role of other, less obvious, regulatory mechanisms, including social norms and physical or technological constraints.¹⁶ Under Lessig's formulation, there are four major categories of constraints that regulate behavior: laws, markets, social norms, and those constraints which are based upon the physical and technological state of the world, which I collectively refer to as "structural constraints."¹⁷

The common thread among all of these regulatory mechanisms is that they restrict or moderate the level of behavior by increasing (or reducing) costs of certain activities.¹⁸ Markets use pricing mechanisms to impose economic costs, social norms impose social costs, and law uses the threat of sanctions to impose expected penal costs.¹⁹ Structural constraints impose physical or technological costs on behaviors.²⁰ Importantly, this cost principle can be generalized: any mechanism which imposes costs on behavior can be seen as a device that society can use or rely upon to regulate behavior.

A. A FRAMEWORK OF CONSTRAINTS AND RIGHTS

From the perspective of regulating behavior, there is less that is exceptional about legal rights than what might appear at first blush. Policymakers often can select among one or more regulatory mechanisms to achieve

14. See, e.g., Cheng, *supra* note 2, at 655–66; Lessig, *supra* note 2, at 661–63.

15. Lessig, *supra* note 2, at 661–65.

16. *Id.* at 662–63.

17. *Id.* The paradigm of a *legal constraint* is a law which explicitly prohibits certain behavior and provides a sanction for its violation—for example, a speed limit. *Markets* are economic mechanisms which regulate through price—the higher the price of a particular activity, typically, the less it will occur. *Social norms* are implicit or explicit social rules about how to behave.

18. Viewed through this general lens of cost imposition, other regulatory mechanisms come into view. Businesses are constrained by internal business policies, trade customs and practices, and fear of loss of reputation within long-term professional relationships. For more on this, see generally Frank B. Cross, *Law and Trust*, 93 GEO. L.J. 1457 (2005).

19. Lessig, *supra* note 2, at 661–65.

20. James Gibson, *Re-Reifying Data*, 80 NOTRE DAME L. REV. 163, 164–65 (2004).

a particular regulatory goal.²¹ In one case, rule-makers might decide to enact an explicit law to moderate behavior; at another time, society might choose to regulate using structural constraints.²² Sometimes multiple constraint mechanisms operate in parallel to constrain a particular behavior through different means.²³ To say that something is a legal right is simply to say that society chose to utilize the *legal* constraint mechanism to regulate the behavior, rather than rely upon one of the alternative regulatory devices.²⁴

With that perspective of constraints as interchangeable regulators in mind, it is possible to generalize upon Wesley Hohfeld's famous formulation of a negative *legal* right. Hohfeld defined an individual "legal right" in terms of how *others* are required to behave in relation to the rights-holder.²⁵ Somewhat counter-intuitively, Hohfeld did not define a "legal right" in terms of the abilities that the *rights-holder* possessed.²⁶ Rather, Hohfeld suggested that a negative legal right is created when *others* have a legal duty to refrain from behaviors that interfere with the rights-holder.²⁷ This definition of a legal right, by way of reference to the restraint of particular conduct by others relative to the rights-holder, suggests a comparable relationship between the non-legal constraint mechanisms and the behaviors that they restrain.²⁸ This generalization of the Hohfeldian formulation, which I term for purposes of this Essay the "constraint-rights framework", emphasizes that non-legal constraint mechanisms may give rise to relationships between constraints and behaviors that are, in many respects, functionally equivalent to those relationships which give rise to legal rights.²⁹

In other words, since certain legal rights—negative individual rights—are defined by reference to behaviors that are constrained, it is analytically useful to conceive of the relationship between non-legal constraints and the behaviors that they constrain as creating analogues to legal interests. To the extent that society relies upon a non-legal constraint, such as structure, to inhibit behavior to reliably protect a "right" *in place of or as a substitute for* a legal constraint that would have had to have been enacted to create an explicit legal right, the constraint-rights framework

21. See Cheng, *supra* note 2, at 657.

22. For a good discussion of this issue, see *id.* at 667–75 (emphasizing that society often overlooks solutions which involve structural constraints in favor of legal constraints—legislation).

23. Often policymakers will regulate a particular behavior by using several constraint mechanisms in parallel to buttress the overall regulatory effect. The paradigm example of this is the earlier example of the fence—a structural constraint—and trespass laws—a legal constraint—operating in parallel to prevent unauthorized entry onto private land.

24. Given that any one of a number of constraint mechanisms could have been selected to achieve a particular regulatory goal, there is arguably a disproportionate focus upon legal constraints regulating behavior.

25. Hohfeld, *supra* note 6, at 16–25; Joseph William Singer, *The Legal Rights Debate in Analytical Jurisprudence from Bentham to Hohfeld*, 1982 WIS. L. REV. 975, 986.

26. Singer, *supra* note 25, at 986.

27. *Id.*

28. See *id.*

29. Hohfeld, *supra* note 6, at 16–25.

suggests that policymakers should expressly query whether a corresponding rights-like relationship—a constraint-right—has been established.

This analytical framework has practical implications in that it is easy to overlook rights-like relationships that are not based in express laws. Importantly, it is also often the case that society's reliance upon non-legal regulators results, not from conscious deliberation on the part of policymakers, but arbitrarily, given the default state of the world in which these non-legal regulators already adequately constrain unwanted behaviors. This is particularly true in the case of latent structural constraints, society's dependence upon which occurs, more often than not, simply as an artifact of the technological state of the world. Such implicit regulation lacks the normative or signaling capabilities of positive law. The constraint-rights framework is therefore of particular importance in the realm of privacy, where many unwanted behaviors are implicitly constrained not by law, but through latent structural constraints.³⁰

B. PRIVACY INTERESTS EXPANDED: CONSTRAINT-RIGHTS AND LEGAL RIGHTS

In the traditional view of privacy, the relevant set of privacy rights are those positive legal rules and doctrines which have been explicitly enumerated by legal rule-makers.³¹ However, a key observation is that many privacy interests are protected not by positive legal prohibitions on behavior, but by structural constraints which act as reliable substitutes for legal constraints.³²

As indicated earlier, explicit structural constraints are the costs imposed by intentionally created physical or technological features in the world.³³ We can think about two different types of structural constraints—explicit and latent structural constraints. The paradigm example of an explicit structural regulator is a physical fence surrounding a piece of property. In that scenario, a certain behavior—entering the property—is constrained by the physical cost that would be incurred by climbing or otherwise circumventing the fence. Another example of an explicit structural constraint is a computer encryption algorithm, which, through technological means, encodes information in such a way that decoding it is difficult and often nearly impossible. This encryption imposes a high technological cost upon the behavior of accessing the underlying information.³⁴

30. Whether a particular behavior is "privacy violating" is a policy issue, as I will discuss in Part III.

31. See, e.g., Solove, *supra* note 1, at 1430.

32. See, e.g., Lawrence Lessig, *The Architecture of Privacy*, 1 VAND. J. ENT. L. & PRAC. 56, 62–64 (1999).

33. *Id.* Lessig's important insight was to highlight the indirect and often unintended regulatory effects that occur as the result of selecting particular technological or physical structural designs.

34. Buildings, highways, and natural features such as mountains and rivers can be seen as implicit structural constraints on behavior. See Neal Kumar Katyal, *Architecture as Crime Control*, 111 YALE L.J. 1039, 1041, 1047 (2002).

Latent structural constraints, by contrast, are the secondary costs arising from the current technological or physical state of the world. The presence of these costs implicitly regulates conduct.³⁵ Under the existing technological state of the world, certain activities are so costly in terms of resources and effort so as to render them effectively impossible to carry out on a widespread basis.³⁶ To illustrate, take the example of the unauthorized sequencing of an individual's DNA to determine susceptibility to certain diseases. As of the time of publication of this Essay, one can view this search behavior as functionally prevented by latent structural constraints; namely, the large amount of resources required to conduct such an analysis. The existence of these costs can be seen as inhibiting the sequencing behavior. As long as these costs persist, society can avoid explicitly regulating this behavior, relying on these latent structural constraints to constrain the conduct. Policy decisions are made—or not made—based upon assumptions about what behaviors are thought to be possible or costly given the current technological state of the world. In this case, this implicit regulation is directly linked to the rapidly changing state of the technology, resulting in a rather fragile constraint.³⁷

It is helpful to examine the idea of regulation by latent structural constraints in the context of a contemporary privacy interest. Privacy is frequently defined as the ability to control information about oneself.³⁸ For illustrative purposes, I will focus upon the example of private information—social security numbers and financial data—appearing within public documents, such as the records of court proceedings.³⁹ We can describe this privacy interest as the right to be free from others finding and using this sensitive personal information.⁴⁰

Traditionally, what would have protected such interests would have been latent structural constraints, rather than legal constraints. A typical court case can generate hundreds or thousands of individual documents. Each of these documents within the public record can be tens or hundreds of pages in length. In the not-too-recent past, these documents were not available electronically. The act of finding a particular piece of information in a public record would have required a physical visit to the public records office, followed by multiple requests to a records clerk for large physical files. This would have been followed by a labor-intensive search for particular words through thousands of pages of documents.

35. Gibson, *supra* note 20, at 164.

36. *Id.* at 164–65.

37. *Id.*

38. See, e.g., Eugene Volokh, *Freedom of Speech and Information Privacy: The Troubling Implications of a Right to Stop People from Speaking About You*, 52 STAN. L. REV. 1049, 1050 (2000); Kent Walker, *Where Everybody Knows Your Name: A Pragmatic Look at the Costs of Privacy and the Benefits of Information Exchange*, 2000 STAN. TECH. L. REV. 2, ¶ 5 (2000), http://stlr.stanford.edu/stlr/articles/00_stlr_2 (defining privacy as “the ability to prevent other people or companies from using, storing, or sharing information about you”).

39. I use this example simply for illustrative purposes. Whether this is an example of an actual privacy interest is a public policy question.

40. See Walker, *supra* note 38, ¶ 5.

Although it was not impossible to conduct such a search, the costs involved effectively constrained such searching behavior for most widespread, privacy-protecting purposes. Frequent, arbitrary, and widespread searches of this nature were too costly to occur on a regular basis.

In this example, the privacy interest—the freedom from having others glean sensitive personal information from public records—was adequately protected by latent structural constraints. Society relied upon an alternative regulatory mechanism—structure—to constrain the behavior as a substitute for what could have been explicitly regulated by law. Note that with the advent of electronically searchable court documents available on public websites, the structural privacy rights calculus changed. Many similar examples of private information protected by the obscuring effects of search costs exist in the privacy realm.

There are functional reasons that impede policymakers from intuitively recognizing these alternative, rights-like relationships under the orthodox rights framework. Legal privacy rights are explicit and more readily discernable from a cognitive standpoint; the fact that certain behaviors are prevented or constrained by non-explicit regulatory mechanisms is more difficult to observe. Moreover, once a particular constraint mechanism is successfully employed, policymakers may be unaware or indifferent as to the details of the regulatory mechanism employed as long as it reliably constrains the unwanted behavior. In other words, as long as some mechanism is acceptably constraining unwanted behavior, the underlying issue and the choice of mechanism will garner little attention. This realization dampens the temptation to conclude that the absence of explicit legal protection for a particular set of privacy interests indicates an affirmative decision on the part of society to leave such interests unprotected. Similarly, it is not always clear, in a given instance, whether the use of a latent structural constraint as the sole regulator of a privacy interest resulted from conscious deliberation on the part of policymakers to leave that interest legally unprotected or was simply as a by-product of the default condition of the world.

Although sometimes policymakers may be indifferent as to the particular means through which unwanted behaviors are regulated, in certain cases, the choice of a particular constraint mechanism becomes important, because not all constraint mechanisms are equivalent in terms of regulatory ability.⁴¹ Some regulatory mechanisms—especially structural constraints—exhibit attributes which render them significantly less durable regulators than legal constraints.⁴² Given that a great deal of privacy is protected by structural, rather than legal, constraints, privacy rights may be therefore disproportionately more vulnerable to erosion than other types of rights. In the next subpart, I compare constraint mechanisms across varying dimensions, exploring why interests that are pro-

41. See Lessig, *supra* note 2, at 662–64.

42. See *id.* at 666–80.

tected by some constraint mechanisms may be relatively more fragile than others.

C. COMPARING DIFFERENT CONSTRAINT MECHANISMS AS REGULATORS

In general, the existing literature has treated the major constraint mechanisms—law, markets, norms, and structure—as distinct species.⁴³ However, it makes sense to view them from a higher level of generality—as simply constraints—in order to evaluate them across various attributes that determine their regulatory ability. In particular, this subpart will focus on the characteristics of structural constraints. In this way, we can see weaknesses that some of the constraint mechanisms exhibit and explore the notion that the quality of the underlying interest is affected by the choice of the constraint mechanism.

Structural constraints are often characterized by the following two attributes: low *violability* and the ability to engage in *self-enforcement*.⁴⁴ “Violability” refers to the degree to which it is possible to violate a particular constraint—to engage in the constrained activity despite the presence of the constraint.⁴⁵ Low-violability constraints tend to fully prevent certain types of conduct *ex-ante* by creating significant costs that effectively limit the range of possible behaviors. High-violability constraints, by contrast, do not preclude the possibility of engaging in the constrained conduct, but carry the threat of imposed costs at a later time. The structural constraints that are the focus of this Essay tend to be somewhat dichotomous and binary in the sense that their presence creates two distinct behavioral states rather than a continuum of possible degrees of behavior.⁴⁶ The first state is one in which the behavior is essentially inhibited in the presence of a constraint and the other in which the behavior is unhindered in its absence.⁴⁷

This point about low-violability is best illustrated by structural constraints based in technology. Computer programs frequently contain complex rules about which actions are allowable in the system. Such rules may be explicit and declarative or implied in the logical structure of the computer program. Rules such as these can be seen as structural constraints on conduct within the system, since typically a system will not permit behavior that runs directly counter to its rules. Within the context of the computer system, such technological structural constraints are essentially inviolable. The system will not permit partial or incremental vi-

43. *See id.* at 662–63.

44. *See generally* Cheng, *supra* note 2, at 664–67 (discussing a similar characterization).

45. *See generally id.* at 664.

46. *Id.* Strictly speaking, regulatory devices are not solely for *constraining* unwanted behavior. Society also uses regulatory devices to encourage, subsidize, or require other, wanted, behaviors. While it would be interesting, in future work, to explore similar analogues to these affirmative devices, that is not the focus of this Essay.

47. *Id.* at 664–65.

olations of the constrained behavior. Instead, the computer system simply will not allow the regulated behavior to occur in the presence of the rule.

By contrast, it is possible to violate nearly all laws. Legal constraints, therefore, exhibit high-violability. A law can only deter behavior based upon the expected cost of sanctions. In fact, economists suggest that violations of a law will occur if the expected benefits from violating the law outweigh the expected costs.⁴⁸ This expected cost is the probability of having the violation detected and the probability of having the sanction enforced via conviction, multiplied by the penalty itself.⁴⁹

To better illustrate this contrast, imagine the task of regulating speeding in motor vehicles.⁵⁰ One approach could involve the use of direct legal constraints—speed limits and prospective legal sanctions.⁵¹ These sanctions could be designed such that the penalties increase as the level of unwanted behavior increases. In such a case, there may be the threat of small monetary fines in the event of smaller violations and progressively greater sanctions as the violations increase. In this scenario, it is possible to engage in the unwanted behavior with the constraining effect of the legal rules resulting from expected ex-post sanctions.

Another approach to this regulatory issue could involve structural constraints.⁵² One could thus imagine an explicit technological rule built into an automobile's computer system which limited the maximum speed of the vehicle to a particular value—say 100 miles per hour.⁵³ In the presence of such a structural constraint, and assuming the inability to circumvent the limitation, the speeding behavior could thus be prevented ex-ante, rather than incrementally deterred. In this scenario, the structural constraint is not only self-enforcing—the constraint itself has the ability to detect and prevent violations—it is non-violable.

This contrast highlights a key point of this Essay—that the nature and quality of the underlying interest can change substantially depending upon the particular constraint mechanism that is employed to regulate the behavior. A world in which particular behaviors are completely prevented ex-ante is substantively different from one in which those behaviors are possible, but simply deterred. In a certain sense, structural regulators can be seen as stronger constraints, in that they can provide a stronger version of negative rights by completely restraining the unwanted behavior that characterizes the right. Thus, a legal right to anonymity of data is arguably weaker than a right to anonymity that is protected by a latent, but essentially inviolable structural constraint.

Because of their low-violability and self-enforcement ability—structural constraints are particularly useful regulatory choice when the goal of soci-

48. Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169, 176 (1968).

49. *Id.* at 177.

50. Cheng, *supra* note 2, at 681–88.

51. *Id.*

52. *Id.* at 689–93.

53. *See id.* at 691 (discussing a similar point).

ety is to prevent rather than moderate a behavior.⁵⁴ In the realm of privacy, society may be more interested in outright preventing, rather than simply incrementally deterring, intrusions. However, this strength of structural constraints also contains a weakness. Since structural constraints employ costs and barriers to regulate, anything that tends to reduce these costs or undermine these barriers significantly reduces their regulatory effectiveness. This often results in sudden and discontinuous loss of regulatory ability on the part of structural constraints, a characteristic not typically evidenced by the other constraint mechanisms. This rapid decrease in regulation by structural constraints is why it is important to reify their implicit regulation. Interests protected solely by structural constraints may be less durable over time, and the shift in regulation is often abrupt.

D. THE STRUCTURAL RIGHTS/EMERGING TECHNOLOGY DYNAMIC

The previous subpart made the point that there are consequences to particular choices of regulatory constraint mechanisms—whether law, structure, norms, or markets—due to differing attributes that tend to characterize the various governance devices. In this subpart, I explore the way in which structural constraints and the correlative structural interests that they protect may be more vulnerable to dissipation than comparable constraint rights which could have arisen out of law, norms, or market constraints. In particular, latent structural constraints are susceptible to weakening by emerging technologies. This recurring phenomenon is what I term the *structural rights/emerging technology dynamic*.

To the extent that society is reliant upon latent structural constraints to prevent privacy-violating behavior, there exists the potential for problematic erosion of privacy. Numerous works in the existing literature have observed the impact of technology on privacy. The work of Lessig in particular has been extremely influential in highlighting the role of emerging technologies in changing the balance in privacy interests.⁵⁵ Others have noted that privacy rights appear to erode over time in the face of new technical capabilities.⁵⁶ This Essay suggests that the observed phenomenon is a manifestation of a general pattern and attempts to describe this dynamic in a general manner by way of the constraint-rights conceptual framework.

The dynamic proceeds as follows: society relies upon latent structural constraints to prevent behavior that would otherwise be considered pri-

54. See *id.* at 662–68.

55. LESSIG, *supra* note 3, at 142–63. Others have noted the reoccurring impact of technology on privacy. See, e.g. Arthur R. Miller, *Personal Privacy in the Computer Age: The Challenge of a New Technology in an Information-Oriented Society*, 67 MICH. L. REV. 1089 (1969).

56. See, e.g., Christopher Slobogin, *Public Privacy: Camera Surveillance of Public Places and the Right to Anonymity*, 72 MISS. L.J. 213, 264–66 (2002); Daniel Solove, *Identity Theft, Privacy, and the Architecture of Vulnerability*, 54 HASTINGS L.J. 1227, 1228–30 (2003).

vacuity-violating. This reliance upon existing, latent structural constraints to regulate behavior can be seen as analogous to an implicit, initial distribution of entitlements in the Coasean sense.⁵⁷ Society's dependence upon structural constraints rather than other constraint mechanisms to protect privacy rests upon assumptions about the technological state of the world. To use the earlier example of private information in paper court records: the physical costs of obtaining the court documents and the difficulty of searching through large amounts of paper documents for one particular piece of information acted as sufficient constraints on the privacy violating activity.

Since the latent structural constraints are simply the costs imposed by the physical or technological state of the world, then their ability to constrain behavior is weakened by anything which tends to lower those costs. Importantly, many emerging technologies possess exactly this characteristic—the tendency to lower transactional and operational costs. This in turn permits conduct which was previously costly or impossible. Consequently, a side-effect of many emerging technologies is the elimination of structural privacy interests through cost reduction. The costs lost are those that previously acted as latent structural constraints—the activity costs that society was relying upon to constrain unwanted behaviors. This dynamic—an emerging technology enabling previously impossible behavior—is a recurring pattern in the realm of privacy.

One can restate this dynamic in terms of this Essay's constraint-rights framework as follows: In the world prior to the emergence of the technology, society relied upon a non-legal regulator to prevent unwanted privacy-violating behavior. It is useful to conceptualize this arrangement as having produced a corresponding constraint-right that is analogous to the positive legal right that would have been created had society regulated the behavior through the use of an explicit rule. This conceptualization allows policymakers to identify privacy rights which are non-obvious because they are implicitly protected by non-legal constraint mechanisms.

With the widespread diffusion of a disabling technology there is effectively a *rights-shift*. The default state of the world changes from one in which the structural privacy interest was adequately protected to a world in which the privacy interest is no longer protected. Assuming that there is no parallel constraint mechanism—law, norms, or markets—to continue to safeguard the privacy right, this phenomenon can be seen as the loss of a previously held right. In Hohfeldian terms, the emerging technology has effectively caused a shift from a structural right scenario to a structural no-right scenario.⁵⁸

57. See Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 8 (1960). Although I do not explore the Coasean implications of initial distributions of structural rights and transaction costs in this Essay, this would be a fruitful topic for further research. An initial intuition is that the dichotomous and binary nature of structural rights make for substantial transaction costs such that it is difficult to bargain around initial rights distributions.

58. See Hohfeld, *supra* note 6, at 30.

To illustrate the point, imagine that the privacy interest in question had instead been protected by an explicit law rather than by a latent structural constraint. The implicit rights-shift can be seen as functionally comparable to a scenario in which policymakers affirmatively decided to abrogate the privacy law. In that case, there would be no confusion as to the fact that the former rights-holders were deprived of a legal right that they once had. The difference is that this implicit rights-shift is based upon exogenous factors—emerging technology—rather than affirmative societal action.

Emphasizing the parallel nature of this implicit rights-shift, relative to the more visible activity of society's enactment and removal of explicit privacy laws, is one of the intended contributions of this Essay. This comparison has rhetorical consequences: Once a structural constraint has eroded, policymakers can elect to use another constraint mechanism—such as a law—to continue to protect the eroded privacy interest. The affirmative use of another regulatory device can be framed as the *continuation* of a previously existing right, rather than the creation of an entirely new legal right. Such a distinction becomes important in the public policy debate over protecting privacy interests where the creation of a new privacy right may prove politically more difficult than the protection of an existing right.

Even when there is a parallel constraint mechanism in place—for example, a legal or normative constraint that persists after the absence of the structural constraint—there may be a significant change on the nature of the underlying interest. As the previous subpart noted, the characteristics of the constraint mechanisms employed can affect the quality of the right. Thus, a violable legal constraint may be less effective at preventing particular behaviors than a prior structural constraint which was non-violable. Such a shift to a relatively weaker form of protection can be seen as somewhat analogous to the substantive effects resulting from changes from property to liability rules.⁵⁹ The ability to prevent or “enjoin” the unwanted behavior can lessen with a change from a structural to a non-structural regulator.

For comparative purposes, it is worth noting that this same dynamic has been seen repeatedly in the realm of intellectual property.⁶⁰ Copyright laws were based upon assumptions about the structural difficulty of copying—for example, the costs involved in duplicating and disseminating creative works. Prior to the widespread dissemination of copying machines, the duplication of texts and photos was a laborious and costly process, typically requiring expensive equipment that put such capabilities out of the reach of the public. These costs of duplication operated as latent

59. See Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713 (1996), (discussing the implications of property rules and liability rules).

60. For a good discussion of similar issues in the intellectual property context, see Gibson, *supra* note 20.

structural constraints, thereby regulating the unwanted behavior of copying works. This was a state of the world upon which policymakers were able to rely, although sometimes they did so in parallel with explicit legal regulations prohibiting the copying behavior. Emerging technologies such as photocopying machines, personal computers, and the Internet dramatically lowered these duplication and distribution costs. The recent imposition of technological limitations on copying and distribution, collectively known as digital rights management (“DRM”),⁶¹ can be seen as an effort to duplicate the lost latent structural protections through the affirmative use of technical structural constraints. Although much of the framework outlined can be applied to the realm of intellectual property, this Essay will primarily focus on the privacy domain, where the issues of structural protection are less intuitively clear.

III. THE STRUCTURAL PRIVACY RIGHT/EMERGING TECHNOLOGY DYNAMIC APPLIED

To render these concepts more tangible, I will illustrate the structural privacy rights/emerging technology dynamic using a contemporary technology that exemplifies this relationship—Radio Frequency Identification (“RFID”). RFID is a rapidly emerging technology. In the next subpart, I will briefly describe the technology, and then situate RFID within the constraint-rights framework that this Essay has formulated by exploring the unintended consequences of its technological diffusion on non-legal—structural—privacy interests. Consistent with the thesis of this Essay, RFID lowers the costs of particular behaviors, and in those instances in which society had relied upon those costs as a behavioral constraint as a substitute for a legal constraint, the erosion of structural privacy rights occurs.

A. AN EMERGING TECHNOLOGY AND ITS EFFECTS ON STRUCTURAL PRIVACY RIGHTS: RADIO FREQUENCY IDENTIFICATION

RFID is an auto-identification technology which uses miniature “tags” to transmit identifying information about objects using radio waves.⁶² The purpose of RFID and other auto-identification technologies—such as the familiar Universal Product Code (“UPC”) barcodes—is to allow computers to acquire information about physical objects in the real world to which the identifier label or tag is attached.⁶³ UPC barcodes, for example, are attached to most items purchased in retail stores and serve the

61. See Timothy K. Armstrong, *Digital Rights Management and the Process of Fair Use*, 20 HARV. J.L. & TECH. 49, 60–65 (2006).

62. SANJAY E. SARMA, STEPHEN A. WEIS & DANIEL W. ENGELS, AUTO-ID CENTER, RFID SYSTEMS, SECURITY AND PRIVACY IMPLICATIONS, 1, 3–4 (2002), <http://www.autoidlabs.org/single-view/dir/article/6/122/page.html>.

63. i2mobilesolutions, Auto ID and the Bar Code, <http://www.paratech.co.uk/auto-id-and-the-barcode.html> (last visited Mar. 17, 2007) (noting that “[t]he term auto ID covers a number of different technologies that enable computers to automatically identify an item, usually by reading data from it [C]ompanies have developed technologies like bar

purpose of communicating to checkout computers identifying information about items being purchased; this is so that the computer can determine the price that should be charged. Similarly, RFID tags are attached to physical items and can communicate identifying information about the nature of the tagged item to a computer system over the air, using radio waves instead of through physical scanning of the barcode.⁶⁴

An example contrasting RFID with the UPC system will best illustrate the novelty of RFID technology.⁶⁵ At a supermarket, a UPC system typically requires a customer to unload every purchased item onto a conveyor belt so that a clerk can pick up each item in order to physically pass that item's UPC barcode over a laser so that the checkout computer can determine the price to charge. This is a costly, time-consuming process.⁶⁶ A supermarket using an RFID system would, instead of physically scanning UPC codes, employ small RFID "tags" which are attached to each individual item. These "tags" are simply low-powered radio transmitters which are capable of sending information about the product using radio waves to a computer several feet away. Since RFID uses radio waves rather than lasers to communicate information, no line-of-site between the reader and the item is required, and identifying information can be exchanged from several feet away. Using RFID, a supermarket could, in theory, process the entire contents of a shopping cart without ever having the clerk or the customer remove an item from a cart.⁶⁷ Each item in the cart would instead radio information about itself from within the cart to the checkout computer. Another familiar example of RFID in everyday use is electronic toll collection systems, which use RFID tags to allow drivers to pay for highway passage without stopping by wirelessly transmitting identifying information about the tag-holder to a receiver at the toll booth.⁶⁸

All RFID systems consist of three main components: *tags*, *readers*, and

codes, RF (radio frequency) tags, magnetic stripe, smart card, optical character recognition (OCR), optical mark readers (OMR).") .

64. See SARMA, WEIS & ENGELS, *supra* note 62, at 3–4. For example, in the case of building security, a typical system might involve a security card carried by an authorized user. The user may have to swipe or slide his card in order to gain entry. The card contains the authorization code. By sliding or swiping the card, the employee is allowing the system to "read" the authorizing data on the card. Thus, the computer system has acquired identifying information about a physical object—namely the card and its authorization information.

65. These scanning applications are auto-identification systems and acquire information about the item being purchased, such as price or brand, by deciphering product data in barcodes affixed to items.

66. By one estimate, the amount of time spent at supermarket checkout is five minutes and thirty-four seconds, with three minutes of that time spent waiting. GAVIN CHAPPELL ET AL., AUTO-ID CENTER, AUTO-ID IN THE BOX: THE VALUE OF AUTO-ID TECHNOLOGY IN RETAIL STORES 10 (2003) <http://www.autoidlabs.org/uploads/media/ACN-AUTOID-BC006.pdf> (citing a 1999 Envirosell study).

67. In such a system, the checkout device will be able to read each item's RFID tag from several feet away and complete the purchase. See *id.*

68. See Jennifer E. Smith, *You Can Run, But You Can't Hide: Protecting Privacy From Radio Frequency Identification Technology*, 8 N.C. J.L. & TECH. 249, 257 (2007).

a *data processing system*.⁶⁹ Tags are typically tiny microchips with antennas that are capable of storing a small amount of data.⁷⁰ They are placed on an object to be identified and are able to broadcast identifying data.⁷¹ Readers are devices which can query the tags to find out what information is stored on the microchips.⁷² Readers may “interrogate” a product’s tag to find information such as an item identification number, location, item type, price, producer, or date of manufacture.⁷³ Since the readers and the tags communicate using radio waves, information can be transmitted over distances of several feet.⁷⁴ Readers are generally connected to a data processing system. Once the reader has obtained identifying information about the item from its tag, it can contact the data processing system to obtain more detailed information about the item or to update the item’s status in the system.⁷⁵

RFID’s major improvement over existing auto-identification technologies is its ability to read information about items at a distance and through barriers.⁷⁶ Current technologies such as barcode scanning and magnetic strip reading require physical or visual proximity of the reader to the item. RFID readers broadcast queries and wait for tags within range to respond.⁷⁷ Radio waves can penetrate barriers, such as walls or boxes, that current technologies cannot.⁷⁸ Using an RFID system, it may be possible to identify items within a closed box, behind the walls of a locked room, or to locate lost items within a crowded warehouse. Since RFID readers talk to tags using radio waves, there need not be physical or visual contact between item and reader in order for communication to take place.⁷⁹

69. Tags are formally known as “transponders,” and readers are formally known as “transceivers.” SARMA, WEIS & ENGELS, *supra* note 62, at 4.

70. *Id.*

71. *Id.*

72. *Id.*

73. *See id.*

74. The distance from which RFID readers can communicate with tags depends upon the type of technology used. At the current time, low-power tags can communicate over a maximum distance of 15 feet, whereas battery-operated tags can communicate over distances of 100 feet or more. *See* KLAUS FINKENZELLER, *RFID HANDBOOK: RADIO-FREQUENCY IDENTIFICATION FUNDAMENTALS AND APPLICATIONS* 6–9, 21 (Rachel Waddington trans., John Wiley & Sons, Ltd. 2d ed. 2003); SARMA, WEIS & ENGELS, *supra* note 62, at 4.

75. *See* FINKENZELLER, *supra* note 74, at 199–218.

76. *Id.* at 6–7. For example, cards with magnetic stripes are often parts of auto-identification systems. Information about the card, such as an account number, is communicated to a computer system, such as an Automated Teller Machine (“ATM”), through the process of swiping. The obvious disadvantage of a system like this is that it requires physical contact between the card and the reader. Physical contact may lead to degradation of the magnetic surface or may be impeded by dust or scratches. *Id.* at 15.

77. *See* SARMA, WEIS & ENGELS, *supra* note 62, at 4.

78. *See id.*

79. There are some limitations on RFID ability, which will be discussed below. For example, RFID tags are limited in their operating range. Additionally, readers and tags may not be able to communicate with one another through certain materials, such as metal or certain types of liquids. *Id.* at 5.

B. STRUCTURAL PRIVACY RIGHTS AND RADIO
FREQUENCY IDENTIFICATION

As this Essay has asserted, under the constraint-rights framework, society implicitly relies upon non-legal constraint mechanisms to prevent unwanted behaviors. In the privacy domain, there is a dependency upon assumptions about the inability or difficulty of engaging in certain behaviors. Such conduct is constrained by the costs of acting: the technological state of the world.⁸⁰ Accordingly, this subpart anticipates a technique for more precisely predicting the privacy interests that will be vulnerable to an emerging technology. This technique is to focus upon the costs that a particular emerging technology tends to reduce. In that way, it is possible to more comprehensively and accurately determine which structural privacy rights will be threatened by the emergence of a given technology. This subpart will apply this concept, focusing upon the costs that RFID technology reduces, which will in turn make clear the behaviors that will no longer be effectively regulated by structural constraints upon RFID's widespread diffusion.

For illustrative purposes, we will assume that RFID technology has been widely diffused and adopted. In a world prior to the emergence of RFID, acquiring identifying information about items behind physical barriers was costly or impossible. For example, identifying the contents of a closed briefcase, a sealed box, or behind a wall was difficult, requiring expensive equipment or physical intrusion. This rendered such behavior effectively inhibited in a pre-RFID world. In terms of the constraint-rights framework, this unwanted behavior was regulated by latent structural constraints—the real-world costs of engaging in this conduct. There is, by the default state of the world, a structural privacy right to be free from this investigatory activity, since presumably society is depending upon these structural barriers to constrain the privacy-violating behavior. The emerging technology dynamic outlined previously predicts that any privacy interests that are dependent upon the existence of these particular costs are vulnerable in a world in which the widespread use of RFID greatly lowers these costs.

As a simple example, assume that there is a privacy right to the secrecy of the contents of one's pockets, or of a closed briefcase.⁸¹ In a world in which most items have embedded RFID tags which are capable of being read through physical barriers, the structural costs which had constrained such intrusive behavior—the physical barriers—may no longer be effective regulators.⁸² Thus, the diffusion of the emerging technology has effectively caused a rights-shift, in which the default state of the world has

80. See discussion *supra* Part II.B.

81. Of course, like all privacy rights, there are certain limitations to the right, such as when one is required to enter detection equipment in order to board an airplane. See, e.g., *United States v. Hartwell*, 436 F.3d 174, 177 (3d Cir. 2006) (holding an x-ray scan at an airport constitutional under the administrative search doctrine).

82. For the purposes of this example, we assume that there are no compensating technological barriers to reading RFID tags, such as encryption or tag disablement.

changed from one in which a particular behavior is constrained by default to a world in which the behavior is no longer constrained by default. Put within the terms of the constraint-rights framework, this can be seen as analogous and tantamount to the abrogation of a hypothetical legal rule which prohibited the behavior.

Another illustration will highlight the different dimensions of structural privacy rights. Under one conception of privacy's role in the modern information society, preserving the secrecy of data prevents the innocent from having data about them taken out of context.⁸³ One characteristic of RFID as an emerging technology is an increased possibility of data being misconstrued in this way; this is because RFID lowers the costs of revealing previously secret data. It is easy to imagine scenarios where, in the RFID-diffused world, incorrect inferences are drawn about individuals innocently possessing illicit materials. For example, we can envision a high school principal who has just confiscated a RFID-enabled, illicit magazine from a student. In today's world, the subsequent disposal of the magazine could proceed as a matter of course, with discretion for both the student and the administration. But one can easily imagine, in the RFID-diffused world, an individual using an RFID reader to detect the materials within the principal's briefcase and drawing incorrect, misleading, and perhaps damaging conclusions from this piece of information. While similar dangers existed in a pre-RFID world, RFID lowers the structural barriers that had previously constrained such behavior.⁸⁴

A final example involves the aggregation and analysis of information about items purchased and possessed by individuals. In some RFID implementations, each tag has the capacity to have its own unique identification number known as an Electronic Product Code ("EPC").⁸⁵ It would therefore be possible to distinguish every item with an RFID tag of a particular type of good from one another. By contrast, most non-RFID systems can typically cannot distinguish identical items of the same type from one another. To such systems, identical items of the same type—say, two cans of the same type of soda—are indistinguishable.

A particular structural cost—the inability to distinguish between identical items of the same type—is therefore potentially reduced by the RFID technology. Behaviors which had been solely regulated by this structural constraint are no longer constrained in the RFID-diffused world. For example, in the pre-RFID world, it is difficult to link an individual to a particular item purchased after the point of sale. Thus, someone who encounters a discarded soda can could not, simply by scanning the can's

83. Lawrence Lessig, *Privacy and Attention Span*, 89 GEO. L.J. 2063, 2065 (2001) ("Privacy's function, in this story, is not to protect the presumptively innocent from true but damaging information, but rather to protect the actually innocent from damaging conclusions drawn from misunderstood information.").

84. For example, in a pre-RFID world, an individual might see the principal carrying the illicit magazine and also draw incorrect conclusions. But since RFID potentially makes it more difficult to conceal things, the opportunity for such intrusions is greater.

85. See SARMA, WEIS & ENGELS, *supra* note 62, at 10.

UPC code, determine who had purchased that particular soda, since every can of soda has an identical UPC code. From the perspective of a UPC code, one can is indistinguishable from another, since every can of a particular type of soda receives the same identifying number. However, in the RFID-diffused world, the cost of uniquely identifying items is lowered, and each individual soda can in a case could have its own individual identifier. Thus, RFID technology could potentially enable the ability to link an individual item to a purchaser simply by reading the item's unique EPC code. This is another illustration of a structural constraint no longer effectively inhibiting a particular behavior due to the cost-lowering effects of an emerging technology such as RFID.

All of these examples illustrate a major point of this Essay—that the choice of a particular mechanism used by society to constrain behavior makes a difference. Different regulatory mechanisms vary across characteristics such as the ability to reliably constrain behavior and their vulnerability to erosion through exogenous factors such as changes in technology. This is especially true in the privacy context, where privacy interests are frequently protected by structural constraints and are vulnerable to erosion by emerging technologies such as RFID.

IV. USING THE CONSTRAINT-RIGHTS FRAMEWORK TO REDUCE SOCIAL COSTS IN PRIVACY LOSS

As this Essay has suggested, a theoretical construct such as the constraint-rights framework can be useful in revealing rights that policymakers could otherwise easily overlook. In particular, latent structural constraints are subtle, non-obvious regulators of behavior.

From a social perspective, there are important benefits to affirmatively viewing these constrained behaviors as structural privacy rights. First, this conceptualization allows policymakers to identify potentially serious privacy losses very early in the technological diffusion process, before an emerging technology achieves widespread adoption and erodes structural constraints.⁸⁶ Since this theoretical framework focuses upon latent costs as the regulators of certain activities, policymakers can anticipate privacy losses simply by examining emerging technologies and the costs that they will tend to reduce. Today, the public debate over privacy and emerging technologies is dominated by those scenarios that are readily imaginable by policymakers and interested parties.⁸⁷ There does not, however, appear to be an explicit, overarching principle for systematically predicting the full range of eroding privacy interests, including those that are implicit. The structural-cost principle—the notion that focusing upon

86. See Gaia Bernstein, *When New Technologies are Still New: Windows of Opportunity for Privacy Protection*, 51 VILL. L. REV. 921 (2006) (providing for a thoughtful discussion of technology diffusion and privacy issues).

87. See, e.g., PrivacyActivism, RFID Position Statement of Consumer Privacy and Civil Liberties Organizations (Nov. 20, 2003), <http://www.privacyrights.org/ar/RFIDposition.htm>; Electronic Privacy Information Center, Radio Frequency Identification (RFID) Systems, <http://www.epic.org/privacy/rfid/> (last visited Mar. 27, 2007).

emerging technologies and the costs that the technologies will reduce as a means of anticipating potentially undesirable behaviors that will be enabled—is one such guide that policymakers could systematically use. Importantly, this principle allows policy makers to anticipate vulnerable privacy interests that have never been previously identified in the public debate.

It is important that policymakers have the ability to identify vulnerable privacy interests early in the diffusion process of emerging technologies. As indicated, the widespread diffusion of an emerging technology effectively causes a rights-shift with respect to privacy interests protected by latent structural constraints. The default state of the world changes from one in which the privacy interest is protected to one in which it is no longer protected due to exogenous factors such as the cost-lowering effects of technologies. The structural rights abstraction can serve as a predictive construct. By permitting the identification of implicit and nonobvious privacy interests at an early stage, policymakers could potentially mitigate the overall social costs that might result by relatively sudden shifts caused by rapidly emerging technologies. For example, policymakers might choose to overlay another regulatory device—law, structure, norms, or markets—in parallel with existing structural constraints, at a time before full technological diffusion occurs. With the dissipation of the structural constraint, there would be one or more other regulatory mechanisms in place. Such parallel regulation could effectively prevent the erosion of a structural privacy interest by keeping the unwanted behavior regulated to some degree, even after the loss of the structural constraint following the emergence of a disabling technology.⁸⁸

To illustrate this point using RFID: If legislators are concerned about the erosion of the privacy right in linking individual purchases to particular individuals, they could enact an explicit legal rule prohibiting such linking behavior before RFID technology becomes widespread enough to permit it. More creatively, legislators could regulate this behavior using explicit structural constraints. Thus, lawmakers could require intentional technological modifications that mimicked the latent structural constraints that protected the privacy rights in the pre-RFID world.⁸⁹ This might take shape in a legislative requirement that the ability to link purchases to individuals be constrained via data encryption embedded in every RFID tag.⁹⁰

88. However, as this Essay has noted, different constraint mechanisms regulate in different ways and are able to constrain behaviors more or less effectively. Thus, the replacement mechanism may not always be equivalent in regulatory ability to the original.

89. See LESSIG, *supra* note 3, at 146–60.

90. Scholars have been advocating a similar position to this in the copyright context. Fair use, a structural right, has been subject to erosion by emerging technologies. Several scholars have advocated countering this erosion by actively implementing fair-use rights via technological measures. See, e.g., Dan L. Burk & Julie E. Cohen, *Fair Use Infrastructure for Rights Management Systems*, 15 HARV. J.L. & TECH. 41, 56 (2001) (advocating discretionary access to publications in a rights management database that would constitute fair use). Others have argued for similar technological protection rights preserving mea-

Like legal rules, structural constraints are both over-inclusive and under-inclusive relative to the behavior that society wishes constrained. Due to limits in precision, legal rules necessarily over-regulate, prohibiting a small amount of behavior that is benign or beneficial in order to constrain a larger amount of undesirable behavior.⁹¹ Since structural constraints are similarly over-inclusive, the loss of a structural constraint via the diffusion of an emerging technology enables some benign behavior along with unwanted behavior. As emerging technologies such as the Internet have demonstrated, it is often impossible to predict, *a priori*, which uses of the technology will maximize social welfare. To simply mimic the structural constraints via another regulatory device may not be a socially desirable outcome: the emerging technology may enable socially beneficial behaviors that society may not want to constrain.

This suggests that the principle of “least constraint” should generally govern: as a rule of thumb, society should continue to prevent only those particular behaviors that are known to be undesirable, and permit the rest.⁹² Thus, it is important to distinguish analytically between the structural mechanism—the *costs* that were constraining particular unwanted behaviors—and the unwanted behaviors themselves. For example, it is helpful to imagine a world in which latent structural constraints governed a particular behavior. Because of the implicit and imprecise nature of these regulations, it is likely that unwanted activities are constrained along with certain desirable activities. However, following the emergence of a cost-lowering technology, these structural constraints no longer govern, and both socially undesirable and socially desirable activities are possible. The structural cost view thus allows policymakers to hone in precisely on the unwanted behaviors and constrain only those, while allowing beneficial behaviors enabled by the technology to persist. This can be thought of conceptually as the disaggregation of individual undesirable behaviors from the larger group of behaviors that were constrained structurally prior to the emergence of the cost-lowering technology.

The framework suggests that the structural privacy rights analysis can be roughly summed up in three questions: What cost is a particular emerging technology reducing? What unwanted behaviors are currently

tures in the privacy context. See, e.g., Shawn C. Helms, *Translating Privacy Values with Technology*, 7 B.U. J. SCI. & TECH. L. 288, 305–14 (2001).

91. Again, a speed limit is the paradigm example of a legal rule that is over-inclusive relative to the behavior it seeks to regulate. If the underlying behavior that a speed limit seeks to prohibit is unsafe driving, then most speed limits are going to prohibit some driving that is safe for the sake of administrability of the rule. A speed limit that is sixty-five miles per hour might be a good proxy for a safe driving speed; clearly, however, a vehicle traveling safely at sixty-seven miles per hour could be safe under many circumstances, but would be constrained under the rule.

92. This is a similar to the argument that has been advocated in favor of so-called net neutrality, in which it is suggested that, *a priori*, it is too difficult to predict which uses of a technology will be the most beneficial. Therefore, the platform with the least restrictions should generally be seen as the best. See, e.g., Brett Firschmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257, 293–98 (2007).

constrained by those costs through existing latent structural mechanisms? and What alternative regulatory mechanisms can society use to continue to constrain the unwanted behaviors, while permitting other enabling uses of the emerging technologies? This conceptualization permits policymakers to more precisely target unwanted behaviors for regulation, while permitting benign activities enabled by emerging technologies.

V. CONCLUSION

Society uses multiple mechanisms to regulate behavior besides law.⁹³ Any device that imposes a cost can be considered a regulator, but in general, the major non-legal regulatory mechanisms are markets, norms, and structure.⁹⁴ Throughout this Essay, I have emphasized that society sometimes implicitly relies upon these alternative regulators in the place of law to prevent unwanted behaviors.

Some legal theorists define a negative right in terms of certain behaviors that are constrained relative to the rights-holder. The reason for this formulation is precisely because it emphasizes the fact that a negative right is the liberty to be free from particular behaviors of others.⁹⁵ In certain circumstances, existing, non-legal constraint mechanisms already inhibit particular unwanted behaviors. The existence of such regulators occasionally obviates the need for society to create an explicit legal prohibition of that behavior. The goal of this Essay has been to suggest that in those instances where society relies upon an existing alternative constraint mechanism as a substitute for law, it is conceptually useful for policymakers to query whether that constrained behavior is analogous to a legal right. This is a generalization, as applied to constraints outside of the legal context, of the above notion that a negative right is created whenever a law prohibits certain unwanted behaviors of others in relation to the rights-holder. This extension of the notion of rights to other regulatory mechanisms outside of law is the basis of a model that I described as the constraint-rights framework.

I noted that different constraint mechanisms, whether law, markets, norms, or structure, vary considerably in terms of their ability to reliably constrain behavior and in their relative vulnerability to various exogenous factors. I compared these various constraint mechanisms across a set of attributes in order to determine the means by which one mechanism might be a weaker or stronger regulator than another. In particular, I explored the strengths and vulnerabilities of structural constraints because, in the privacy context, a great deal of unwanted behavior is constrained, not explicitly through law, but implicitly by alternative constraint mechanisms such as latent structural constraints. Since many behaviors that society would consider privacy-violating are prohibited by latent structural constraints, and because latent structural constraints are

93. See discussion *supra* Part II.

94. See *supra* notes 14–17 and accompanying text.

95. See Hohfeld, *supra* note 6, at 30–32.

dependent upon costs imposed by the technological state of the world, structural privacy rights—privacy rights protected solely by structural constraints—are vulnerable to erosion by emerging technologies which lower behavioral costs and enable previously costly activities.

This slow erosion of structural privacy interests occurs repeatedly as new, cost-lowering technologies become prevalent. At some point, technologies become so widespread that, effectively, a shift in the distribution of societal entitlements may occur. In terms of the constraint-rights framework, behaviors which had been previously constrained solely by a non-legal mechanism become unconstrained by default. If the underlying assumptions which formed the basis of policy action or inaction suddenly change, then policymakers should expressly confront the issue of shifting entitlements, rather than allowing exogenous factors to passively settle it.

This sudden change in privacy status can result in unnecessary social costs. I suggested that policymakers can avoid the social costs incurred by the sudden nature of the privacy loss by examining particular emerging technologies through the lens of the constraint-rights framework. In other words, by analyzing emerging technologies in terms of the costs that they are lowering and the particular structural privacy rights that are protected by those costs, it is possible to comprehensively predict privacy losses well before they become socially problematic. Policymakers can, by distinguishing between the costs and the unwanted behaviors, use one or more of the other regulatory mechanisms to constrain privacy-violating behaviors while permitting any beneficial behaviors enabled by the emerging technologies. Moreover, from a rhetorical standpoint, those facing the imminent loss of structural rights can frame the issue in terms of preserving existing rights, rather than the solicitation of completely new rights.

In sum, the intention of this Essay has been to suggest that it is theoretically useful to explicitly label the implicit societal dependencies upon non-legal regulatory devices, especially when such a relationship is functionally comparable to the one surrounding a legal right, and to demonstrate the practical implications of this conceptualization in terms of societal protection of implicit privacy rights.

Comments

