CODE

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Threats to liberty change. In England, norms may have been the threat to free speech in the late nineteenth century; I take it they are not as much a threat today. In the United States in the first two decades of the twentieth century, the threat to free speech was state suppression through criminal penalties for unpopular speech; the strong protections of the First Amendment now make that particular threat less significant.[2] The labor movement was founded on the idea that the market is sometimes a threat to liberty—not so much because of low wages, but because the market form of organization itself disables a certain kind of freedom.[3] In other societies, at other times, the market is a key to liberty, not the enemy.

Thus, rather than think of "liberty's enemy" in the abstract, we should focus upon a particular threat to liberty that might exist in a particular time and place. And this is especially true when we think about liberty in cyberspace. I believe that cyberspace creates a new threat to liberty, not new in the sense that no theorist had conceived of it before,[4] but new in the sense of newly urgent. We are coming to understand a newly powerful regulator in cyberspace. That regulator could be a significant threat to a wide range of liberties, and we don't yet understand how best to control it.

This regulator is what I call "code"—the instructions embedded in the software or hardware that makes cyberspace what it is. This code is the "built environment" of social life in cyberspace. It is its "architecture."[5] And if in the middle of the nineteenth century the threat to liberty was norms, and at the start of the twentieth it was state power, and during much of the middle twentieth it was the market, then my argument is that we must come to understand how in the twenty-first century it is a different regulator—code—that should be our current concern.

But not to the exclusion of other significant "regulators." My argument is not that there's only one threat to liberty, or that we should forget other, more traditional threats. It is instead that we must add one more increasingly salient threat to the list. And to see this new, salient threat, I believe we need a more general understanding of how regulation works—one that focuses on more than the single influence of any one force such as government, norms, or the market, and instead integrates these factors into a single account.

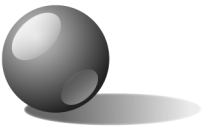
This chapter is a step toward that more general understanding.[6] It is an invitation to think beyond the threat to liberty from government power. It is a map for this more general understanding.

A DOT'S LIFE

There are many ways to think about "regulation." I want to think about it from the perspective of someone who is regulated, or, what is different, con-

strained. That someone regulated is represented by this (pathetic) dot—a creature (you or me) subject to different regulations that might have the effect of constraining (or as we'll see, enabling) the dot's behavior. By describing the various constraints that might bear on this individual, I hope to show you something about how these constraints function together.

Here then is the dot.



How is this dot "regulated"?

Let's start with something easy: smoking. If you want to smoke, what constraints do you face? What factors regulate your decision to smoke or not?

One constraint is legal. In some places at least, laws regulate smoking—if you are under eighteen, the law says that cigarettes cannot be sold to you. If you are under twenty-six, cigarettes cannot be sold to you unless the seller checks your ID. Laws also regulate where smoking is permitted—not in O'Hare Airport, on an airplane, or in an elevator, for instance. In these two ways at least, laws aim to direct smoking behavior. They operate as a kind of constraint on an individual who wants to smoke.

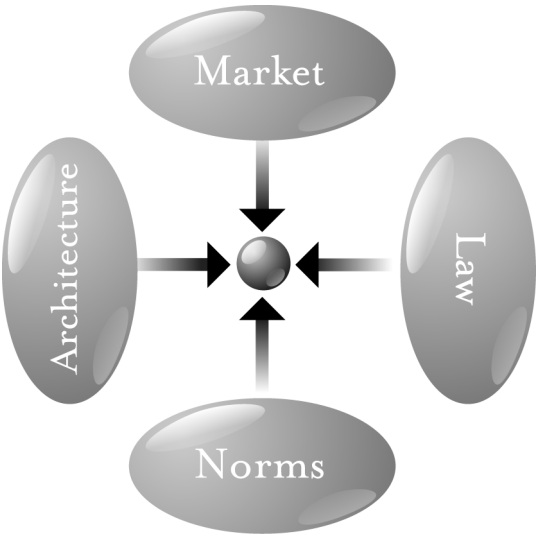
But laws are not the most significant constraints on smoking. Smokers in the United States certainly feel their freedom regulated, even if only rarely by the law. There are no smoking police, and smoking courts are still quite rare. Rather, smokers in America are regulated by norms. Norms say that one doesn't light a cigarette in a private car without first asking permission of the other passengers. They also say, however, that one needn't ask permission to smoke at a picnic. Norms say that others can ask you to stop smoking at a restaurant, or that you never smoke during a meal. These norms effect a certain constraint, and this constraint regulates smoking behavior.

Laws and norms are still not the only forces regulating smoking behavior. The market is also a constraint. The price of cigarettes is a constraint on your ability to smoke—change the price, and you change this constraint. Likewise with quality. If the market supplies a variety of cigarettes of widely varying quality and price, your ability to select the kind of cigarette you want increases; increasing choice here reduces constraint.

Finally, there are the constraints created by the technology of cigarettes, or by the technologies affecting their supply.[7] Nicotine-treated cigarettes are addictive and therefore create a greater constraint on smoking than untreated cigarettes. Smokeless cigarettes present less of a constraint because they can be smoked in more places. Cigarettes with a strong odor present more of a constraint because they can be smoked in fewer places. How the cigarette is, how it is designed, how it is built—in a word, its architecture—affects the constraints faced by a smoker.

Thus, four constraints regulate this pathetic dot—the law, social norms, the market, and architecture—and the "regulation" of this dot is the sum of these four constraints. Changes in any one will affect the regulation of the whole. Some constraints will support others; some may undermine others. Thus, "changes in technology [may] usher in changes in . . . norms,"[8] and the other way around. A complete view, therefore, must consider these four modalities together.

So think of the four together like this:



In this drawing, each oval represents one kind of constraint operating on our pathetic dot in the center. Each constraint imposes a different kind of cost on the dot for engaging in the relevant behavior—in this case, smoking. The cost from norms is different from the market cost, which is different from the cost from law and the cost from the (cancerous) architecture of cigarettes.

The constraints are distinct, yet they are plainly interdependent. Each can support or oppose the others. Technologies can undermine norms and laws; they can also support them. Some constraints make others possible; others make some impossible. Constraints work together, though they function differently and the effect of each is distinct. Norms constrain through the stigma that a community imposes; markets constrain through the price that they exact; architectures constrain through the physical burdens they impose; and law constrains through the punishment it threatens.

We can call each constraint a "regulator," and we can think of each as a distinct modality of regulation. Each modality has a complex nature, and the interaction among these four is also hard to describe. I've worked through this complexity more completely in the appendix. But for now, it is enough to see that they are linked and that, in a sense, they combine to produce the regulation to which our pathetic dot is subject in any given area.

We can use the same model to describe the regulation of behavior in cyberspace.[9]

Law regulates behavior in cyberspace. Copyright law, defamation law, and obscenity laws all continue to threaten ex post sanction for the violation of legal rights. How well law regulates, or how efficiently, is a different question: In some cases it does so more efficiently, in some cases less. But whether better or not, law continues to threaten a certain consequence if it is defied. Legislatures enact;[10] prosecutors threaten;[11] courts convict.[12]

Norms also regulate behavior in cyberspace. Talk about Democratic politics in the alt.knitting newsgroup, and you open yourself to flaming; "spoof" someone's identity in a MUD, and you may find yourself "toaded";[13] talk too much in a discussion list, and you are likely to be placed on a common bozo filter. In each case, a set of understandings constrain behavior, again through the threat of ex post sanctions imposed by a community.[14]

Markets regulate behavior in cyberspace. Pricing structures constrain access, and if they do not, busy signals do. (AOL learned this quite dramatically when it shifted from an hourly to a flat-rate pricing plan.)[15] Areas of the Web are beginning to charge for access, as online services have for some time. Advertisers reward popular sites; online services drop low-population forums. These behaviors are all a function of market constraints and market opportunity. They are all, in this sense, regulations of the market.

Finally, an analog for architecture regulates behavior in cyberspace—code. The software and hardware that make cyberspace what it is constitute a set of constraints on how you can behave. The substance of these constraints may vary, but they are experienced as conditions on your access to cyberspace. In some places (online services such as AOL, for instance) you must enter a

password before you gain access; in other places you can enter whether identified or not.[16] In some places the transactions you engage in produce traces that link the transactions (the "mouse droppings") back to you; in other places this link is achieved only if you want it to be.[17] In some places you can choose to speak a language that only the recipient can hear (through encryption);[18] in other places encryption is not an option.[19] The code or software or architecture or protocols set these features, which are selected by code writers. They constrain some behavior by making other behavior possible or impossible. The code embeds certain values or makes certain values impossible. In this sense, it too is regulation, just as the architectures of real-space codes are regulations.

As in real space, then, these four modalities regulate cyberspace. The same balance exists. As William Mitchell puts it (though he omits the constraint of the market):

> Architecture, laws, and customs maintain and represent whatever balance has been struck in real space. As we construct and inhabit cyberspace communities, we will have to make and maintain similar bargains—though they will be embodied in software structures and electronic access controls rather than in architectural arrangements.[20]

Laws, norms, the market, and architectures interact to build the environment that "Netizens" know. The code writer, as Ethan Katsh puts it, is the "architect."[21]

But how can we "make and maintain" this balance between modalities? What tools do we have to achieve a different construction? How might the mix of real-space values be carried over to the world of cyberspace? How might the mix be changed if change is desired?

ON GOVERNMENTS AND WAYS TO REGULATE

I've described four constraints that I've said "regulate" an individual. But these separate constraints obviously don't simply exist as givens in a social life. They are neither found in nature nor fixed by God. Each can be changed, though the mechanics of changing them is complex. Law can have a significant role in this mechanics, and my aim in this section is to describe that role.

A simple example will suggest the more general point. Say the theft of car radios is a problem—not big in the scale of things, but a frequent and costly enough problem to make more regulation necessary. One response

might be to increase the penalty for car radio theft to life in prison, so that the risk faced by thieves made it such that this crime did not pay. If radio thieves realized that they exposed themselves to a lifetime in prison each time they stole a radio, it might no longer make sense to them to steal radios. The constraint constituted by the threatened punishment of law would now be enough to stop the behavior we are trying to stop.

But changing the law is not the only possible technique. A second might be to change the radio's architecture. Imagine that radio manufacturers program radios to work only with a single car—a security code that electronically locks the radio to the car, so that, if the radio is removed, it will no longer work. This is a code constraint on the theft of radios; it makes the radio no longer effective once stolen. It too functions as a constraint on the radio's theft, and like the threatened punishment of life in prison, it could be effective in stopping the radio-stealing behavior.

Thus, the same constraint can be achieved through different means, and the different means cost different amounts. The threatened punishment of life in prison may be fiscally more costly than the change in the architecture of radios (depending on how many people actually continue to steal radios and how many are caught). From this fiscal perspective, it may be more efficient to change code than law. Fiscal efficiency may also align with the expressive content of law—a punishment so extreme would be barbaric for a crime so slight. Thus, the values may well track the efficient response. Code would be the best means to regulate.

The costs, however, need not align so well. Take the Supreme Court's hypothetical example of life in prison for a parking ticket.[22] It is likely that whatever code constraint might match this law constraint, the law constraint would be more efficient (if reducing parking violations were the only aim). There would be very few victims of this law before people conformed their behavior appropriately. But the "efficient result" would conflict with other values. If it is barbaric to incarcerate for life for the theft of a radio, it is all the more barbaric as a penalty for a parking violation. The regulator has a range of means to effect the desired constraint, but the values that these means entail need not align with their efficiency. The efficient answer may well be unjust—that is, it may conflict with values inherent in the norms, or law (constitution), of the society.

Law-talk typically ignores these other regulators and how law can affect their regulation. Many speak as if law must simply take the other three constraints as given and fashion itself to them.[23]

I say "as if" because today it takes only a second's thought to see that this narrowness is absurd. There were times when these other constraints were

treated as fixed—when the constraints of norms were said to be immovable by governmental action,[24] or the market was thought to be essentially unregulable,[25] or the cost of changing real-space code was so high as to make the thought of using it for regulation absurd.[26] But we see now that these constraints are plastic.[27] They are, as law is, changeable, and subject to regulation.

The examples are obvious and many. Think first about the market: talk of a "free market" notwithstanding, there is no more heavily regulated aspect of our life.[28] The market is regulated by law not just in its elements—it is law that enforces contracts, establishes property, and regulates currency—but also in its effects. The law uses taxes to increase the market's constraint on certain behaviors and subsidies to reduce its constraint on others. We tax cigarettes in part to reduce their consumption, but we subsidize tobacco production to increase its supply. We tax alcohol to reduce its consumption. We subsidize child care to reduce the constraint the market puts on raising children. In many such ways the constraint of law is used to change the constraints of the market.

Law can also change the regulation of architecture. Think about the Americans with Disabilities Act (ADA).[29] Many of the "disabled" are cut off from access to much of the world. A building with only stairs is a building that is inaccessible to a person in a wheelchair; the stairs are a constraint on the disabled person's access to that building. But the ADA in part aims to change that constraint by requiring builders to change the design of buildings so that the disabled are not excluded. Here is a regulation of real-space code, by law, to change the constraint that real-space code creates.

Other examples are even better.

- Some of the power of the French Revolution derived from the architecture of Paris: The city's small and winding streets were easily barricaded, making it possible for revolutionaries to take control of the city with relatively little absolute strength. Louis Napoleon III understood this, and in 1853 he took steps to change it.[30] Paris was rebuilt, with wide boulevards and multiple passages, making it impossible for insurgents to take control of the city.
- Every schoolchild learns of L'Enfant's design to make an invasion of Washington difficult. But more interesting is the placement of the White House relative to the Capitol. The distance between them is one mile, and at the time it was a mile through difficult terrain (the mall was a swamp). The distance was a barrier meant to tilt the intercourse between Congress and the president by making it marginally more difficult for them to connect—and thereby more difficult for the executive to control the legislature.