

Thoughts on Techno-Social Engineering of Humans and the Freedom to Be Off (or Free from Such Engineering)

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This Article examines a constitutional problem that largely goes unnoticed and unexamined by legal scholars — the problem of techno-social engineering of humans. After defining terms and explaining the nature of the problem, I explain how techno-social engineering of humans is easily ignored, as we perform constrained cost-benefit analyses of incremental steps without contemplating the path we are on. I begin with two nonfiction stories, one involving techno-social engineering of human emotions and a second involving techno-social engineering of children's preferences. The stories highlight incremental steps down a path. Then, through plausible fictional extensions, I explore steps further down the path. The Article ends with a fact pattern familiar to every reader. It explains how the electronic contracting environment we experience regularly online is an example of techno-social engineering of humans with the (un)intended consequence of nudging humans to behave like machines — perfectly rational, predictable, and ultimately programmable.

INTRODUCTION

This Article focuses on a constitutional problem that largely goes unnoticed and unexamined by legal scholars — the problem of techno-social engineering

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of humans.¹ Humans have been shaped by technology since the dawn of time, and of course, humans have shaped other humans through technology for a very long time as well. This has garnered significant attention in the context of the workplace and mass media such as radio and television. Still, the scale and scope of “human construction” through technological means has not been uniform over time, and I suspect that we’ve experienced acceleration over the past few decades with the near-ubiquitous deployment of various information and communications technologies. Looking at the present and to the near future, one thing seems clear: interconnected sensor networks, the Internet of Things,² and (big) data-enabled automation of systems around, about, on and in human beings promise to expand the scale and scope significantly. It is the fine-grained, hyper-personalized, ubiquitous, continuous and environmental aspects of the techno-social engineering that make the scale and scope unprecedented and, as I suggest in this Article, of constitutional significance.³

Privacy law scholars come closest to the problem. They pay close attention to developments in technology, especially those that involve the generation, acquisition, processing, storage, and use of data.⁴ Accordingly, many privacy

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- 1 This Article is part of a book project. See BRETT FRISCHMANN & EVAN SELINGER, BEING HUMAN IN THE TWENTY-FIRST CENTURY (forthcoming 2017); see also Brett Frischmann, *Human-Focused Turing Tests: A Framework for Judging Nudging and Techno-Social Engineering of Human Beings* (Cardozo Legal Stud. Research Paper No. 441, 2014), <http://ssrn.com/abstract=2499760>.
 - 2 The Internet of Things has been described as “a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies.” *Internet of Things Global Standards Initiative*, ITU, <http://www.itu.int/en/ITU-T/gsi/iot/Pages/default.aspx> (last visited Jan. 31, 2016); see *Internet of Things*, WIKIPEDIA, https://en.wikipedia.org/wiki/Internet_of_Things (last modified Dec. 15, 2015).
 - 3 I refer to small “c” constitutional, referring to the collection of legal theories, norms, customs and understandings that make up the fundamental law of the land, rather than capital “C” constitutional, which may be a specific written constitution or the U.S. Constitution. For further explanation on small “c” constitutional and capital “C” constitutional, see Lisa Austin, *Technological Tattletales and Constitutional Black Holes: Communications Intermediaries and Constitutional Constraints*, 17 THEORETICAL INQUIRIES L. 451, 452 (2016); and Lisa M. Austin & Dennis Klimchuk, *Introduction*, in PRIVATE LAW AND THE RULE OF LAW 1 (Lisa M. Austin & Dennis Klimchuk eds., 2014).
 - 4 See generally PRIVACY IN THE MODERN AGE: THE SEARCH FOR SOLUTIONS (Marc Rotenberg et al. eds., 2015); DANIEL J. SOLOVE, NOTHING TO HIDE: THE FALSE TRADEOFF BETWEEN PRIVACY AND SECURITY (2013); ALAN F. WESTIN, PRIVACY AND FREEDOM (2015).

scholars are concerned with data collection and use, the presence or absence of informed consent, the sorts of inferences that can be made about them and others, the discriminatory uses of information, and the “black boxes” that hide data-driven, often automated decision-making processes.⁵ These are incredibly important issues and deserve the attention they are receiving, but there is an important set of normative questions lurking below the surface of privacy debates that I would like to consider and frame as follows: *What sorts of people do we want to be? What sort of society do we want to build and sustain? What obligations do we owe to past, present and future generations, and how should such obligations shape the technological and social institutions we build and sustain?* These types of fundamental normative questions may seem too abstract, philosophical, or political to be of much use or relevance to privacy scholars. They also may seem tangential or simply unrelated to privacy. Such views are mistaken. The normative questions are unavoidable and answered, one way or another, whether directly or indirectly, through the technological and social institutions and society we build and sustain, and a host of consequences simply follow.

Privacy, like many areas of information and communications law,⁶ is fundamentally about these basic constitutional questions and attendant consequences. The various technologies and data that privacy scholars pay attention to often, if not always, enable techno-social engineering of humans. Yet strikingly, only few privacy scholars and legal scholars give any attention to techno-social engineering of humans.⁷ There may be a few reasons for such inattention. First, some degree of such engineering is inevitable, and it may seem impossible to measure, much less judge, degrees of techno-social engineering.⁸ Second, legal scholars may look favorably on law as an acceptable tool for techno-social engineering, though they may not describe it as such, and evaluating other competing tools may seem beyond their area of expertise. Third, any attempt to evaluate or judge techno-social engineering may seem paternalistic, at best, and speculative fear-mongering, at worst.

5 See, e.g., FRANK PASQUALE, *THE BLACK BOX SOCIETY: THE SECRET ALGORITHMS THAT CONTROL MONEY AND INFORMATION* (2015).

6 See, e.g., Brett Frischmann, *Cultural Environmentalism and the Wealth of Networks*, 74 CHI. L. REV. 1083 (2007) (asking similar questions with respect to intellectual property and communications laws).

7 See Ryan Calo, *Code, Nudge, or Notice?*, 99 IOWA L. REV. 773 (2014); Julie E. Cohen, *What Privacy Is For*, 126 HARV. L. REV. 1904 (2013); Niel M. Richards, *The Dangers of Surveillance*, 126 HARV. L. REV. 1934 (2013); Niel M. Richards, *The Perils of Social Reading*, 101 GEO. L.J. 689 (2013).

8 This is a significant difficulty, which I seek to remedy elsewhere. See FRISCHMANN & SELINGER, *supra* note 1; Frischmann, *supra* note 1.

Fourth, to question techno-social engineering is to question *innovation*, a risky undertaking for any modern legal scholar.⁹ This Article is not the place to fully explore these obstacles to serious inquiry about techno-social engineering of humans. But it is a start.

Techno-social engineering has different meanings across various contexts, and at the outset, it is helpful to explain what I mean by the term and the scope of my inquiry.¹⁰ First, I am interested in *techno-social engineering of humans*. Human beings are the objects being engineered.¹¹ This is critical. What does it mean to engineer humans? For my purposes, engineering is merely one of many words that are more or less synonyms; engineer is quite close in meaning to construct, influence, shape, manipulate, make, nudge, and other such terms. Some will object and insist on teasing out distinctions, but the distinctions are not critical here and in fact can be distracting.¹² Of the words I listed, only manipulate strikes a worrisome chord; by comparison, the others seem benign, although this is a false impression that leads to a false sense of security. Manipulation generally means covert engineering and entails ulterior motives. It is important to recognize, however, that manipulation captures

9 Innovation rivals capitalism among modern American gods, and it is blasphemous to question progress or attempt to slow down innovation and consider which path society might choose. Cf. NEIL GAIMAN, *AMERICAN GODS* (10th ed. 2011); see also Brett Frischmann & Mark McKenna, *Comparative Analysis of (Innovation) Failures and Institutions in Context* (2016) (unpublished manuscript) (explaining the incredible variety in actual normative objectives that are, or can be, conflated in the buzzword *innovation*, and how appeals to innovation in the abstract or without more specific normative commitments are ultimately useless and often merely (dis)guises for other objectives, such as a commitment to capitalism or *laissez faire*).

10 I do not subscribe fully to either technological or social determinism. The dynamic and constitutive relationships between social and technological tools and the complex systems within which they are nested and deployed is not easily reduced to a series of cause and effect relationships.

11 Of course, the engineers are also human beings.

12 The distinctions may matter, of course, in specific settings. For example, consumer protection laws may treat influence favorably but manipulation unfavorably. Manipulation implies unfairness, information asymmetry, dishonesty, unequal bargaining or power relationships. See, e.g., Ryan Calo, *Digital Market Manipulation*, 82 GEO. WASH. L. REV. 995 (2014). Scholars also have drawn reasonable distinctions between benign socialization and manipulation. See, e.g., GERALD DWORKIN, *THE THEORY AND PRACTICE OF AUTONOMY* (1988); DIANA T. MEYERS, *SELF, SOCIETY, AND PERSONAL CHOICE* (1989); JOSEPH RAZ, *MORALITY OF FREEDOM* (1986); Paul Benson, *Oppressive Socialization*, 17 SOC. THEORY & PRAC. 385 (1991).

a set of risks and harms but ignores others. Repeated interactions with an environment designed to shape your beliefs and preferences in an open and transparent manner might not involve manipulation. But it may nonetheless be dehumanizing, due to how it impacts subjects, for example, by increasing their programmability and leading them to behave more robotically.¹³ Simply put, manipulation conceptually captures a set of risks and harms but ignores others.

To make matters worse, the worrisome chord struck by the perceived threat of manipulation triggers the same old reactionary tune. As the examples discussed below make clear, the threat of manipulation often seems to pull our attention to questions of *process* — e.g., was there informed consent? Did the engineer or choice architect leave the affected people with some modicum of choice, such as the ability to opt out? — and away from engaging more fundamental questions of *substance*, including individual and systemic *consequences*, the concentration and exercise of *power*, and potentially conflicting and incommensurable *normative values* and fundamental tradeoffs.¹⁴ Unfortunately, this tendency too often leads to distorting myopia¹⁵ and consequently failure to engage meaningfully with the fundamental normative questions that matter most.¹⁶

To avoid such myopia, I use the umbrella term *engineering* because it is neutral yet purposive. Engineering suggests the informed design and use of tools to serve a purpose or achieve a particular end. Evaluation necessarily depends on the purpose and consequences.¹⁷ Engineering also suggests the existence of human engineers and tool users, who may but need not be the

13 For other examples and further consideration of different dimensions along which dehumanization might occur, see FRISCHMANN & SELINGER, *supra* note 1; and Frischmann, *supra* note 1.

14 Of course, process and substance are not independent. One could argue that we've already had this debate and already enshrined our substantive commitments in our institutional structures. For a nice explanation why long-standing commitments often require reassessment, see David Post, *Against "Against Cyberanarchy,"* 17 BERKELEY TECH. L.J. 1365 (2002).

15 See Brett Frischmann, *Two Enduring Lessons from Elinor Ostrom*, 9 J. INST. ECON. 387 (2013) (explaining how such myopia "leads to great distortions in our perceptions about the world and the plans we make").

16 See the italicized questions in the second paragraph of this Article.

17 Engineering is often defined in terms of the use of scientific or technological knowledge to inform the design of devices, tools, processes, products, and systems to solve a problem or execute a function. I expand the definition slightly to encompass a broader knowledge base in part because, as explained below, I include social institutions within the techno-social engineering toolkit.

same. Thus, evaluation also depends on the relationships among engineers, tool users, and those humans being engineered.

It is important to note the means of engineering — specifically, engineering through the use of social and technological tools. Of course, the use of tools is what makes the term engineering seem appropriate and more resonant than other terms, but I must emphasize that too often labeling something with the other terms is a rhetorical strategy that obscures and makes the so-labeled project seem more palatable. For example, nudging is often used to describe the project of designing “choice architectures” through legal and related social institutions for the purpose of shaping human behavior.¹⁸ The “architects” are psychologists, economists, lawyers, and politicians rather than engineers. But make no mistake: designing choice architectures is engineering, and nudging is simply a more palatable way to say techno-social engineering. I use techno-social to describe the category of tools because I include legal and social institutions with technologies in the toolbox, and I also regard technologies as necessarily social and vice versa.¹⁹

In any civilization, techno-social engineering of humans is inevitable and, *in the abstract*, value-neutral. There are “good” and “bad” applications, examples, and consequences, and the difficulty society faces is often in the evaluation. For subjects of such engineering, it can be difficult to identify, much less evaluate the consequences. Elsewhere, I focus on this issue extensively and develop a framework for identifying and evaluating techno-social engineering with a particular focus on when humans are engineered to behave like machines.²⁰

In this Article, however, I show how techno-social engineering of humans is too easily ignored, as we perform constrained cost-benefit analyses of incremental steps without contemplating the path we are on. To accomplish this objective, I tell two stories that make plain and real what otherwise might seem like science fiction. This methodology is atypical for developing a theoretical argument, but it usefully highlights issues and hypotheses that otherwise remain obscure. I begin in Part I with two *nonfiction* stories, one involving techno-social engineering of human emotions, and a second involving techno-social engineering of children’s preferences. The stories highlight

18 See, e.g., RICHARD H. THALER, & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* (2008); DAN ARIELY, *PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS* (2008); On Amir & Orly Lobel, *Stumble, Predict, Nudge*, 108 COLUM. L. REV. 2098 (2008).

19 There is a rich literature in science and technology studies (and related fields) that develops these points in substantial detail. See generally *THE HANDBOOK OF SCIENCE AND TECHNOLOGY STUDIES* (Edward J. Hackett et al. eds., 3d ed. 2008).

20 See FRISCHMANN & SELINGER, *supra* note 1; Frischmann, *supra* note 1.

incremental steps down a path. Standing alone, each incremental step appears to be cost-benefit justified based on laudable goals and cost-effective means, but the cost-benefit analyses in fact may be truncated. There may be unintended consequences worth considering.²¹ Then, through fictional extensions made in Part II, I explore plausible steps further down the path. The Article concludes its storytelling with a familiar fact pattern. It is also nonfiction. It explains how the electronic contracting environment we experience regularly online is an example of techno-social engineering of humans with the (un)intended consequence of nudging humans to behave like machines — perfectly rational, predictable, and ultimately programmable.

I. STORIES

A. Facebook's Emotional Engineering Experiment

On June 17, 2014, the *Proceeding of the National Academies of Science (PNAS)* published an article titled *Experimental Evidence of Massive-Scale Emotional Contagion Through Social Networks*.²² The short article reported on a remarkable experiment that demonstrated that emotional states can be transferred to others by emotional contagion. Researchers at Facebook and Cornell University conducted the experiment and “manipulated the extent to which people (N = 689,003) were exposed to emotional expressions in their News Feed.”²³ Unbeknownst to a few hundred thousand people, Facebook deliberately reduced their exposure to their friends’ positive (negative) posts, depending on which conditions Facebook applied. In other words, Facebook deliberately exposed people to the test contagion and then watched to see what would happen. It turns out that the results of the experiment showed that emotional contagion exists and can be deployed by Facebook. People exposed to more positive (negative) posts tended to post more positive (negative) posts relative to the control groups. Moreover, people “exposed to fewer emotional posts (of either valence) in their News Feed were less expressive overall on the following days,”²⁴ which the authors described as a withdrawal effect. The authors concluded:

21 See FRISCHMANN & SELINGER, *supra* note 1; see also Frischmann, *supra* note 1

22 Adam D.I. Kramer, Jamie E. Guillory & Jeffrey T. Hancock, *Experimental Evidence of Massive-Scale Emotional Contagion Through Social Networks*, 111 PROC. NAT’L ACAD. SCI. U.S. 8788 (2014).

23 *Id.* at 8788.

24 *Id.* at 8790.

[G]iven the massive scale of social networks such as Facebook, even small effects can have large aggregated consequences: For example, the well-documented connection between emotions and physical well-being suggests the importance of these findings for public health. Online messages influence our experience of emotions, which may affect a variety of offline behaviors. And after all, an effect size of $d = 0.001$ at Facebook's scale is not negligible: In early 2013, this would have corresponded to hundreds of thousands of emotion expressions in status updates per day.²⁵

Not surprisingly, a firestorm followed publication of the study. Bloggers, media pundits, researchers, Facebook users, and others debated the ethics of the research.²⁶ Most of them focused on whether the researchers should have obtained informed consent from the research subjects and whether the Institutional Review Board (IRB) at Cornell should have played a greater role in regulating, supervising, or monitoring the research. These are very important ethical issues. A few months later, the *New York Times* reported on some progress: researchers studying us on social networks and other digital media are now grappling with ethics and may develop guidelines to govern how they experiment on us.²⁷ Thank goodness!

But we might not want to leave it to the engineers and tool users. We subjects should grapple with the ethics as well.²⁸ To get a sense of where you stand, consider a few questions:

1. Is deliberate emotional engineering by Facebook a problem of process (no informed consent for the subjects) or substance (emotional engineering)?
2. If it is a problem of inadequate process: Is IRB review a solution? What about informed consent? What does that mean to you? Pretend you're negotiating a one-to-one contract with Facebook. What exactly would you agree to? Would clicking "I agree" when you sign up for the service be enough?

25 *Id.*

26 For a collection of sources, see James Grimmelman, *The Facebook Emotional Manipulation Study: Sources*, THE LABORATORIUM (June 30, 2014), http://laboratorium.net/archive/2014/06/30/the_facebook_emotional_manipulation_study_source. To get a sense of the debate, browse the sources listed under *Journalism* or *Commentary*.

27 Vindu Goel, *Under the Microscope*, N.Y. TIMES, Aug. 13, 2014, at B-1.

28 I must admit some confusion on whether to refer to us as subjects or objects. The process-oriented discussions tend to focus on the ethics of human subjects research. But substantively, the emotional engineering treats us as objects. This is an old and difficult issue.

3. If it is a problem of substance, can you explain the problem without reliance on adjectives like creepy? Can you articulate what exactly is wrong with emotional engineering by Facebook?
4. Is it acceptable for Facebook to induce or suppress the emotional contagion of your friends?
5. Suppose Facebook tests, develops, and optimizes its emotional engineering capability to help people make *better* decisions? Would it be acceptable for Facebook to induce or suppress impulsive purchases (or at least, clicks)?
6. Suppose Facebook optimizes its emotional engineering capability specifically to minimize emotional interference with rational decision-making. Would this nudge people to make better decisions? Would people nudged in this fashion act like machines? Would they be (or could they be) any less human?
7. Suppose Facebook optimizes its emotional engineering capability and lets users choose the settings — dial up some happiness! Would you use it?

These are difficult questions. The lack of informed consent and role of IRB are important issues, but they are the tip of the iceberg. Of course, the tip is all that gets attention until too late. The deeper issues (reflected in questions 3-7) are substantive, have less to do with the research process or this particular experiment, and more to do with the technological capacity for techno-social engineering that Facebook is testing. To be clear, Facebook is testing a tool, a potentially powerful one. For what purpose? What are the predictable consequences? How about the unpredictable or unintended consequences?²⁹

When I read the Facebook study, this is what caught my attention: *massive-scale emotional contagion through social networks*. The type of response (human emotion) being engineered mattered — struck a chord, if you will — but so did the scale, scope, and power of the tool being tested. Of course, with respect to the first concern — human emotion being engineered — we must acknowledge that many things alter our moods every day. Advertisers and politicians (and their various consultants) are expert manipulators, and so are the rest of us. We try to influence each other regularly, for better or worse. We nudge each other. That's a big part of what socializing and communicating entails. Emotional contagion is not the only social contagion, but it can be a powerful nudge. Many technologies play an integral role in shaping our beliefs, emotions, and wellbeing, sometimes, but not always, in ways we know about and at least partially understand.

But systematic techno-social engineering of human emotions on and by platforms, like Facebook, that constitute the environments we live in daily

29 It may seem like such questions are out of bounds, unfair, or simply premature. But ask yourself why. I suspect there may be a few reasons, *see supra* Introduction, but interfering with innovation probably tops the list.

may be much more challenging to know about and evaluate, and it may become more pervasive. In particular, such engineering may be much harder to know about and understand *independently* of the platforms' influence on emotional and other social contagions. A focus on process alone, therefore, will *never* be sufficient. As privacy scholars have long recognized,³⁰ informed consent can be manufactured, in the sense that technological platforms can shape one's beliefs and preferences with respect to that for which consent is sought.³¹ Aside from the emotional contagion experiment, Facebook is a rather straightforward example, at least when one focuses on privacy. The beliefs and preferences of millions — perhaps a generation — have been shaped over the past decade. Facebook set out to accomplish this objective — at least, to encourage broad sharing of content — and largely has been successful.³² Although public outcry about the emotional contagion experiment might lead one to conclude that Facebook would not be able to obtain consent from users for emotional engineering because their existing preferences may conflict, such a conclusion seems somewhat far-fetched. Facebook has not, to my knowledge, abandoned the technology or practice, nor have Facebook users revolted and ceased to use the service. Further, there is plenty of time for Facebook to both develop its technology and gradually shape its users' beliefs and preferences regarding the technology. Only time will tell.

We need to engage the ethics, including both process and substance, and we need to develop better tools for identifying and evaluating such techno-social engineering. After all, we only know about Facebook's experiment

30 See JULIE E. COHEN, CONFIGURING THE NETWORKED SELF: LAW, CODE, AND THE PLAY OF EVERYDAY PRACTICE 252 (2012) (describing how the United States system of consumer protection against invasions of privacy revolves around a “purely proceduralist” model of notice and consent).

31 Some scholars insist that preferences are not shaped; instead, they believe preferences are latent and are discovered over time, revealed to oneself and the world through one's actions and exposure to advertising, marketing, and information that better helps one to understand what one truly prefers. For a discussion of different views within economics, see Geoffrey M. Hodgson, *Reconstitutive Downward Causation: Social Structure and the Development of Individual Agency*, in INTERSUBJECTIVITY IN ECONOMICS: AGENTS AND STRUCTURES 159 (Edward Fullbrook ed., 2002).

32 My claim is not that Facebook has eliminated privacy preferences. Many people, including young people, care about privacy and take steps to protect their privacy, for example, by managing privacy settings. See Danah Boyd & Eszter Hargittai, *Facebook Privacy Settings: Who Cares?*, FIRST MONDAY (Aug. 2 2010), <http://firstmonday.org/ojs/index.php/fm/article/view/3086/2589>.

because it published the results. We will return to this example below. But first, here is another short story.

B. Using Activity Watches to Surveil and Shape Elementary School Children

Last year, my first-grader came home after school very excited. “Dad, I won. I mean, I’ve been picked. I get a new watch.” “That’s great,” I said, “What happened?” He quickly rattled off something about being one of the kids in his class who was selected to wear a new watch for gym class.

A day or two later, I received the following letter in the mail from the school district:

Dear Parents/Guardians,

Your child has been selected to be among the first group of students to participate in an exciting new initiative made possible by our recent \$1.5 million PEP Grant.

We have added ACTIVITY WATCHES to the K-12 physical education program so that we can assess how the PEP grant impacts students’ physical activity in [the school district]. We are periodically selecting groups of students at random to wear activity watches on their wrists to track daily activity time.

One of the goals of our program is to see that students get the recommended amount of physical activity each day (60 minutes). As part of a quality physical education program, the use of activity watches can motivate students to challenge themselves to become more physically active.

For the students selected to participate in this first group, we will be distributing activity watches starting January 13th for students to wear before, during, after school and over the weekend until Tuesday, January 21st. We ask that students do not take off the watch once it’s on their wrist. They should sleep, even shower with the watch in place. There are no buttons to push or need to touch the watch, as it is pre-programmed to record and store each day of activity time.

At the end of the 9 days, each family will be able to access a report of their child’s activity, and you are welcome to consult with your child’s physical education teacher about what you learn and ways to further support your child’s physical health and fitness. In addition, the group’s combined information will be used to provide baseline data on student physical activity in [the school district].

In closing, I invite you to join me and your child's physical education teacher in motivating your family to participate in physical activity together. If you should have any questions about this new technology, please do not hesitate to contact your child's physical education teacher.

Yours in health,

XXXX XXXXXXXX

Supervisor of Health, Physical Education and Nursing Services

What would your reaction be? I ask you to think about it for a moment before I tell you my reaction because mine was atypical, at least in my community.³³

When I read the letter, I went ballistic. I teach and write about information and technology law, so perhaps I am just atypical. But I could not help but wonder about various privacy issues — Who? What? Where? When? How? Why? — with regard to the collection, sharing, use, and storage of data about kids. The letter did not even vaguely suggest that parents and their children could opt out, much less that their consent was required. Even if it had, it couldn't be informed consent because there were so many questions left unanswered, and there was no mechanism to manifest consent or a lack thereof — no written form to sign, not even an "I Agree" box to check on a website.

I also wondered whether the school district had gone through some form of IRB process; they had not. Had someone, anyone, considered the ethical questions? Whether or not the school district's data collection qualifies as research, and whether or not the regulations that require IRB evaluation apply to this particular context, the underlying ethical issues were more or less the same as those present in situations of human subject research at a university. Or worse, the ethical issues might be even more complicated since the environment school children face is arguably more coercive and dependent upon on trust than the university laboratory. I had to go through the IRB process for a research project in the past, and so I couldn't help but wonder.

33 This is not the only example of schools using activity trackers. See Sam Thielman, *Fitbit Used to Track Students' Physical Activity at Oral Roberts University*, GUARDIAN, Jan. 29, 2016, <http://www.theguardian.com/us-news/2016/jan/29/oral-roberts-university-fitbit-students-physical-fitness-freshman-15>; Scott Yeoman, *Fitbit Addicts Alarm School Counsellors*, NZ HERALD, Jan. 23, 2016, http://www.nzherald.co.nz/lifestyle/news/article.cfm?c_id=6&objectid=11578266; Tia Ghose, *Fitness Trackers Could Boost Kids' Health, But Face Challenges, Experts Say*, LIVE SCIENCE (Feb. 27, 2014), <http://www.livescience.com/43719-fitness-trackers-for-kids.html>; Noizmakaz, *Wearing a Fitbit Is Now a Necessity in Oral Roberts University*, MEDIUM (Feb. 4, 2016), <https://medium.com/@noizmakaz/wearing-a-fitbit-is-now-a-necessity-in-oral-roberts-university-133be4efee60#w079itque>. For further discussion, see FRISCHMANN & SELINGER, *supra* note 1.

I read the letter again but got stuck on: “We ask that students do not take off the watch once it’s on their wrist. They should sleep, even shower with the watch in place.” Seriously, bath time and bedtime surveillance! I couldn’t believe it, and I couldn’t believe that the school district could be so clueless. How could the school district ignore the obvious ethical and privacy issues?

I read the letter again and it made me think of one of those Nigerian bank scam emails that go straight into my spam folder. Such trickery! I thought. Then I remembered how my son had come home so excited. The smile on his face and joy in his voice were unforgettable. It was worse than an email scam. They had worked him deeply, getting him hooked. He was so incredibly happy to have been selected, to be part of this new fitness program, to be a leader. How could a parent not be equally excited? Most were, but not me.

I emailed some friends from town and asked if their kids had been selected, if they had received the same letter, and if they were going to let their kids participate. A few had. None had thought it was a big deal. All of them had let their children participate. I did not. My son understood after a lengthy explanation, but it wasn’t easy for him or me.

There is much more to the particular story. I contacted someone at the PTA, spoke with the Supervisor of Health, wrote a letter to the School District Superintendent, and eventually had some meetings with the General Counsel for the school district. The program is like so many being adopted in school districts across the country: well-intentioned, aimed at real problems (obesity; lack of fitness), financed in an age of incredibly limited and still shrinking budgets, and elevated by the promise that accompanies new technologies. Fortunately, I live in a great town, and everyone I spoke to was eager to learn and talk more about the issues that hadn’t even occurred to them. What caught their attention most was a line from the letter I sent to the Superintendent: “I have serious concerns about this program and worry that [the school district] hasn’t fully considered the implications of implementing a child surveillance program like this.” No one previously had called it “child surveillance”; all of a sudden the creepiness of bath time and bedtime surveillance sank in.

Surveillance is what generated a visceral reaction, and so it was an effective means for getting people to stop and think about the program. But up to that point, no one seemed to have done so for a number of obvious reasons. People trust the school district (the choice architects), and they love technology. The salient problem of obesity weighs heavily on the community, and the activity watches seem to be a less intrusive means for addressing the problem. People obtain information about their activity levels and then are better able to adjust their behavior and improve fitness. They can do so on their own, as a family, or in consultation with the physical education teacher. Plus, it was funded by a federal grant. The activity watch program presents substantial upside

with little or no downside, an easy cost-benefit analysis. For most people, it seems like one of those rare win-win scenarios. And many nudges, when viewed incrementally, may seem this way. But are they?

The most pernicious aspect of the program is not the 24-7 data collection, nor is it the lack of informed consent. To be clear, these are real problems; I am not saying otherwise. But these concerns don't quite capture an important issue lurking a bit deeper, which is how the school district's use of the activity watches is a form of techno-social engineering practiced on children. Of course, the Department of Education, the school district, and other program supporters understand that they are engaged in social engineering in the sense that they use the activity watches and corresponding surveillance to shape cultural attitudes and individual preferences regarding fitness and activity. That much is more or less transparent. It is a simple nudge because the program aims to generate and provide information about activity levels and fitness, and thereby enable better choices. The Activity Watch program has a laudable intended purpose — to combat obesity by encouraging more exercise — and it employs seemingly laudable means — autonomy-preserving nudges rather than mandates.³⁴

The deeper concern I have with the program is the unexamined techno-social engineering, specifically, how the program shapes the preferences of a generation of children to accept (without question or concern) a 24-7 wearable surveillance device that collects and reports data to others. Even though autonomy and choice might be preserved, the more subtle influence on beliefs and preferences works at a different level and will shape a host of future choices. It increases tolerance of surveillance, manipulation, and nudging — of techno-social engineering.

Incremental steps of this sort may seem, in isolation, justifiable, especially on a constrained cost-benefit calculus that only considers immediate and obvious costs and benefits. The bottom line is not necessarily to reject the use of activity watches or similar technologies in public schools. Perhaps their use is justifiable as an effective means to combat obesity and encourage fitness. However, such a view can be dangerously myopic because it ignores the cumulative effects of many, interdependent yet still incremental steps. Privacy is but one victim of death by a thousand cuts. Therefore, a school district that chooses this path ought to do so more carefully, with an awareness of and open dialogue about how the technology affects the human beings, the children. As I said to the general counsel for the school district, this is a

34 Students and parents still decide for themselves whether to change their activity levels. They retain their autonomy, which is an important condition for nudges. THALER & SUNSTEIN, *supra* note 18.

decent teaching opportunity. Fitness and privacy might be joined as students learn about the technology and their relationships to it and to others, including the school, the Department of Education, the device manufacturer and other entities that obtain access to the data and can use it or sell it.

II. SLIGHT EXTENSIONS

These two true stories bring to mind fictional ones. First, suppose Facebook optimizes its emotional engineering technology and expands beyond its social network interface on the Internet into the Internet of Things and smart homes.³⁵ Thus, suppose Facebook extends its optimized emotional engineering capability outside the social network environment it has constructed to the other environments within which we live our lives. For example, suppose Facebook deploys its emotional engineering technology in your home, automobile, and workplace through networked sensors and communications devices. Would you consent? Would you be able to? Does your answer depend on whether or not you are in control, whether you could choose the settings?³⁶

One question I genuinely struggle with concerns *who is doing the emoting* and whether it even matters. Suppose you live in an environment within which Facebook successfully programs your emotions. Perhaps you consented and even chose the setting, or perhaps your parents did so on your behalf long ago. Facebook provides a comprehensive set of stimuli that trigger a predictable,

35 See Evan Selinger & Brett Frischmann, *Will the Internet of Things Result in Predictable People?*, GUARDIAN, Aug. 10, 2015, <http://www.theguardian.com/technology/2015/aug/10/internet-of-things-predictable-people>.

36 This reminds me of a conversation I had recently. I asked a colleague how he would feel about being a “mere brain in a vat with his happiness optimized by some technical system.” Without hesitation, he responded, “Extremely happy, I guess.” For him, the stipulation made it easy; he suggested that intuitions derived from the hypothetical just tend to fight the hypothetical and its stipulation. Many people simply have doubts about it being possible or whether there is something hidden in the stipulation of optimal happiness. If we remove those doubts, however, and take the hypothetical and stipulation as unassailably true, he was confident in his answer and, as he told me afterwards, he would choose to be in such a state if he could. People tend to have mixed feelings about the thought experiment. See also THE MATRIX (Village Roadshow Pictures 1999) (which color pill would you choose, red or blue?); PHILLIP K. DICK, DO ANDROIDS DREAM OF ELECTRIC SHEEP? (1968) (describing the Penfield mood organ, which users could control).

predetermined set of emotional responses. Who is emoting? Facebook or you (or your parents)? Does it matter?

Of course, no one believes that when you read a novel and become happy or sad that anyone besides you is emoting, although we might say that the author is communicating and perhaps jointly sharing emotions. Is the author engaged in techno-social engineering? Yes, in a sense. Authorship entails the informed use of language and other “tools” to communicate, entertain, and stimulate emotional reactions. The novel itself is a techno-social “tool” designed to serve those purposes. It provides a set of stimuli and triggers emotional reactions.³⁷ Generally, this is something we encourage and celebrate.

How, then, is the hypothetical emotional engineering any different? It is a combination of factors, the most important of which seem to be the following: the scale and scope of the techno-social engineering, the marriage of deterministic engineering and engineered determinism, and the simultaneously environmental and acutely personalized nature of the techno-social engineering. These differentiating factors are complex, hard to mark and evaluate. For the objects being engineered and society generally, the difficulty is in knowing when a line is crossed, if in fact a meaningful line can be identified.³⁸

The Facebook experiment and the hypothetical extension highlight steps along a path. We may doubt we’ll ever get to the end point, or even very far down the path. But can you be sure? How might humans and society change along the way? Elsewhere, I explore these issues further, considering the plausibility and implications of a distributed and networked “experience machine.”³⁹ Such a technology need not be something one “plugs into,” and it need not be a virtual world or “cyberspace,” apart from our physical “bricks-and-mortar” or “meatspace” environment. Instead, it could involve a comprehensive reconstruction of our physical environment with networked sensors and continuous, interactive systems. I say a bit more on this below,⁴⁰ but for now, let us return to a hypothetical that is, perhaps, closer to home.

With regard to the activity watch story, imagine attending a school board meeting where the board presents the next Department of Education grant proposal. The proposal involves an upgrade to the activity watch program, an opportunity to build upon its success and communitywide acceptance. Having successfully deployed the activity watches for a few years, the children, parents

37 Of course, we could extend the analysis to beliefs and preferences.

38 The reverse of a Turing test might help. See Frischmann, *supra* note 1.

39 FRISCHMANN & SELINGER, *supra* note 1, ch. 1 (titled “Welcome to the Experience Machine n.0”); see also ROBERT NOZICK, ANARCHY, STATE AND UTOPIA 42-45 (1974) (discussing experience machine).

40 See *infra* text accompanying note 48.

and teachers have grown accustomed to the technology, and for some, the fitness gains are impressive. The upgrade entails deployment of an additional activity sensor. This sensor monitors brain activity. The collected data enables students, parents, and teachers to evaluate attentiveness and engagement and improve mental fitness. Initially, the upgrade only will be available to selected fourth, fifth and sixth grade students who already have activity watches. Over the course of the next two years, the user base will be extended gradually until all of the students are participating. Would you support the proposal? Is this meaningfully different from the activity watches? Suppose that instead of only measuring brain activity for attentiveness, the sensor mapped brain activity and then tailored instruction and evaluation based on such maps.

We could go on. Each incremental upgrade to the activity watch⁴¹ seems justifiable on its own terms, and it only gets easier. That is, the first step makes the second more palatable, harder to resist or even notice. But will we proceed down this path? Have we already begun to do so? My two stories do not *prove* anything, much less support the contestable claim I noted in the Introduction, i.e., that techno-social engineering of humans exists on an unprecedented scale and scope, and it is only growing more pervasive as we embed networked sensors in our public and private spaces, our devices, our clothing and ourselves. It is difficult to prove such a claim. It requires a complicated evaluation of the past, present and near future.

Elsewhere, I trace the history of humans and our techno-social engineering tools.⁴² I argue that the rise of Taylorism and Fordism in the early twentieth century marked a significant change, if not transformation, in the power of techno-social engineering to diminish our humanity. These approaches to business management are famous both for their underlying *motivations* (to increase efficiency, quality, and productivity for the ultimate benefit of managers, owners, capitalists) and *means* (manage factory workers in various ways that get them to behave like machines). The assembly line is a particularly salient example that highlights the tradeoffs and concerns about dehumanizing workers. I emphasize a critically important yet often hidden aspect of this type of techno-social engineering. It is the environmental nature of the means, the way in which the managers employing the management practices advocated by Taylor (and later adapted by Ford) reconstructed the physical and social environments within which their workers worked. The factory not only produced whatever widget the company eventually sold (e.g., Ford's automobiles), but it also produced machine-like humans, sometimes

41 Of course, upgrades to activity watches or other worn devices may be replaced with other technologies, such as a neural implant, that perform the same function.

42 FRISCHMANN & SELINGER, *supra* note 1, ch. 2.

referred to as automatons. Of course, critics of Taylorism recognized and railed against this effect on workers, but architecting the environment to achieve this particular effect is the technological “innovation” to note. Over the past century that innovation has been deployed in workplace contexts beyond the factory floor as well as other contexts, such as public schools. Workplaces and schools are interesting examples because both define and in part are defined by the physical spaces and social institutions that together constitute particular environments designed to engineer humans. Moreover, both constitute a major part of people’s day-to-day lives, rather than incidental ones.

Another set of related techno-social engineering tools that spread like wildfire in the twentieth century are mass media, such as radio and television. These tools do not define or constitute physical environments, but instead, mass media “reach” into environments, such as workplaces and the home, and in a (limited) sense, engineer humans within these environments by altering the range of stimuli that affect the beliefs, preferences and actions of humans within those spaces. Both radio and television are well-studied examples of such techno-social engineering.⁴³ In the United States, the power of mass media never quite reached the levels depicted in dystopian science fiction (though some might dispute this claim), but nonetheless mass media have had a significant influence on American culture, politics, economy and society.⁴⁴ An important characteristic of mass media as tools for techno-social engineering is the reach, just mentioned, and another is the increased attenuation and distance between those within the environment and those exerting influence through the media.

But my present- and future-oriented claim still seems rooted in the past and not yet fully supported. What is the set of technologies that leads me to believe that the scale and scope of “human construction” through socio-technological means has accelerated over the past few decades? Mass media seem on the one hand to be a precursor with a strong legacy and on the other a relevant part of the ongoing wave of cultural change. The answer is the near-ubiquitous deployment of various information, computation and communications technologies. Along with computers is a host of adjacent technologies associated with computation, digitalization, datafication, virtualization, automation, and many-to-many communication. These technologies have had an incredible, generally beneficial, impact on the world. The Internet has transformed many

43 Robert M. Entman, *How the Media Affect What People Think: An Information Processing Approach*, 51 J. POL. 347 (1989).

44 Mass media does not itself have independent agency or influence. Rather, mass media are techno-social tools developed and used by people.

different systems (economic, cultural, social, political, educational, etc.⁴⁵), and correspondingly has transformed the environments within which humans live their lives; so many formative actions and interactions that humans take have been shaped by these changes in the physical, social and cultural environments.

Thus, in examining the scale and scope of techno-social engineering of humans, we can no longer limit our attention to the isolated examples of the factory floor or public school. We must extend our analysis to almost every other space, including the home and many public spaces. Mass media reached into those spaces, but incompletely and discontinuously. The Internet increased the reach, interconnection, and continuity.

One may argue that, in the present, the various environments within which we live our lives remain separate, even if potentially interconnected and interdependent. We have not been and are not always *on*. To the contrary, we have retained and regularly exercised the capability or *freedom to be off*.

Yet that will change. This is my admittedly speculative claim about the future, but such speculation seems warranted. In my opinion, the actual — practical, situated and reasonably exercisable *freedom to be off*, to be free from systemic, environmentally architected human engineering is *the* — or at least, one of the — fundamental constitutional issues we, as a society, need to confront. Constitutionalsists have always had to ask, grapple with, and answer the foundational and ultimately intergenerational normative question of what sort of society we want to build. In the twenty-first century, this question is unavoidably about the scale and scope of techno-social engineering of humans and the actual freedom to be free from such engineering — at least, sometimes, for some meaningful portion of our lives.⁴⁶

As I have noted, if we look at the present and to the near future, interconnected sensor networks, the Internet of Things, and big data-enabled automation of systems around, about, on and in human beings promise to expand the scale and scope of techno-social engineering significantly. These technological systems enable the reconstruction of our everyday environments and, for better or worse, us. It is the data-driven, fine-grained, hyper-personalized, ubiquitous, real-time, continuous and environmental aspects of the techno-social engineering that make the scale and scope unprecedented.

Though not appreciated by most people, even in the technology community, the potential economic value of interconnected sensor networks, the Internet

45 See BRETT M. FRISCHMANN, *INFRASTRUCTURE: THE SOCIAL VALUE OF SHARED RESOURCES* (2012). It is hard to imagine a system that hasn't been transformed, or at least significantly affected, by the Internet.

46 See Julie E. Cohen, *Examined Lives: Informational Privacy and the Subject as Object*, 52 *STAN. L. REV.* 1373 (2000).

of Things, and big data depends on the construction and, to a significant degree, automation of systems around, about, on and in human beings. Put another way, interconnected sensor networks, the Internet of Things, and big data are not in and of themselves valuable. Demand for such technologies is derived demand. Many in the business and technology fields assume that these technologies are the next best thing, without really knowing why.⁴⁷ There is a perception of technological power and potential, almost inevitability, but actual consumer demand remains uncertain and likely will continue to be so for quite some time; it likely needs to be stoked, if not outright created (another job for the marketing and advertising community that undergirds much of the modern information economy.)

Let us focus briefly on one set of rapidly emerging technologies in the set I've mentioned, specifically, the Internet of Things. Wikipedia provides the following definition:

The Internet of Things (IoT, sometimes Internet of Everything) is the network of physical objects or “things” embedded with electronics, software, sensors, and connectivity to enable it to achieve greater value and service by exchanging data with the manufacturer, operator and/or other connected devices based on the infrastructure of International Telecommunication Union’s Global Standards Initiative. Internet of Things connect physically and remotely by individuals, for both public sector and private sector, in the sense of a computer network grid, of a created electrical device that is in place, with economic benefit and potential usefulness. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure. Experts estimate that the IoT will consist of almost 50 billion objects by 2020.⁴⁸

The “Internet of Things” may be a misnomer, but it is a clever rhetorical move, if in fact it was intentional. The Internet, as we know it (or at least, as we may like to remember it), is an infrastructure that connects *people*. Almost everything that occurs on the Internet involves the communication of information between people — it is social, relational, and it involves the creation and sharing of information.⁴⁹ So what is the clever rhetorical move?

47 It is the *Field of Dreams* phenomena: “If you build it, they will come.” FIELD OF DREAMS (Gordon Co. 1989).

48 *Internet of Things*, WIKIPEDIA, https://en.wikipedia.org/wiki/Internet_of_Things (last modified Dec. 15, 2015).

49 There are, of course, many communications between machines that enable the Internet to function effectively, and there are even higher-layer communications

It is to replace people with things. Of course, the Internet of Things is a metaphor, but frankly, metaphors matter. The Internet of Things metaphor reveals an explicit and implicit shift in framing.⁵⁰ While people might look at this as simply the next step in the evolution of the Internet and adjacent computing technologies and systems, perhaps the next frontier, the regulatory implications, could be dramatic — and I don't just mean government regulation, I also mean regulation by architecture and technology, i.e., *techno-social engineering*, because of the ways in which the environment that we live within and interact with changes. Instead of being in the foreground, the Internet of Things may push people to the background. The focus shifts subtly from humans actively communicating with each other to devices gathering and exchanging data and automating various technological processes to make the lives of human beings easier and more efficient. The Internet then would be simply a means for ubiquitously distributed sensors — mobile and stationary devices, mere things — to gather, process, exchange and act upon data. The things are primary; they are technological and neutral; they require investment and involve innovation, and will allow service providers — private and public alike — to more cheaply and efficiently provide us with whatever it is we supposedly want and need. But they also will allow those same service providers to engage in techno-social engineering of humans — of, at least, our beliefs, preferences, and emotions — if the incremental steps we have seen in recent years are any indication.

My claim is not that the sky is falling or that this is a unique set of concerns. Rather, we have witnessed and even managed to deal with similarly complex issues before. Yet this fact should not lead us to be complacent or to blindly trust in technology or the belief that humanity will inevitably persevere. The technologies I've noted and the techno-social engineering they enable are not inherently bad or good, but they are not neutral either. They reflect choices with consequences, choices that someone will make. There are different paths society can choose to take, and we should not forgo our responsibility to ourselves and future generations to evaluate our options and make difficult decisions. To do so, I believe, requires that we develop better tools for evaluating technology and humanity — as I mentioned, that is a project for another day.

generated by programs. These are usually examples of communications that are either inputs that facilitate human communications at higher layers or constitute communications of the human who wrote or is running the program. Besides, as we move toward the Internet of Things, it will be the case that the Internet as we know it changes and perhaps becomes the Internet as we like to remember it.

50 The Internet of Everything metaphor is equally suggestive. It certainly doesn't hide the ambitions of scale, scope and power.

But still you might be skeptical, particularly about the scale, scope, and pervasiveness aspects of my contestable claim. Let me close with one last story, one which moves beyond a single incremental step and with which you have direct experience.

III. THE LAST STORY

Consider a system where a choice architect modifies a digital environment to make using digital services more seamless.⁵¹ Navigating web pages and online content has an incredible amount of legal baggage that requires consent. Transaction and information costs can be stifling. This choice architect structures the environment to minimize the burden on the user when consenting to terms. It is an environment where the rational response to terms of use pages (links, really) requires little thought and imposes no burden on the user because “acceptance” is reduced to a single click of the mouse. If this is starting to look familiar, it is because this is our current online contracting environment. The contracting environment is choice-preserving in the sense that users retain their autonomy; they have the opportunity to opt out of the web application’s services. Of course, a user’s blind acceptance of the terms of use is completely rational. To read the proposed (imposed) terms would be a complete waste of time, an irrational and ultimately futile exercise.⁵²

It seems natural to distinguish this scenario from those that involve the government. Contracting is, after all, a private affair, the holy grail of private ordering. While many of us may feel ashamed, cheated, disappointed, or otherwise less than satisfied with our contracting behavior, despite its perfect rationality, we cannot complain about coercion, much less government paternalism. *Or can we?*

The electronic contracting environment within which we find ourselves behaving perfectly rationally is not natural. It is constructed. Of course, this is old news. But it is worth reiterating. Contract law is a socially constructed institution that shapes the transactional environments in which people negotiate and formulate legally respected and binding commitments and relationships.

51 As seen below, the choice architects include both judges and website designers.

52 Cf. Yannis Bakos, *Florenca Marotta-Wurgler & David R. Trossen, Does Anyone Read the Fine Print? Consumer Attention to Standard Form Contracts*, 43 J. LEGAL STUD. 1, 1 (2014) (“[O]nly one or two of every 1,000 retail software shoppers access the [software] license agreement and that most of those who do access it read no more than a small portion.”); Margaret Jane Radin, *Taking Notice Seriously: Information Delivery and Consumer Contract Formation*, 17 THEORETICAL INQUIRIES L. 515 (2016).

In general, contract law is an incredibly liberating social infrastructure that greatly enhances the autonomy of individuals and groups. Yet contract law has changed dramatically over the past half-century to accommodate changes in economic, social, and technological systems. It is not necessarily as liberating for all.

The electronic contracting environment we're all familiar with is a product of and completely contingent upon both the evolved contract law and the technological systems through which we interact, communicate, transact, and form relationships. Both could be different. Contract law was different, and it could have accommodated changes in economic, social, and technological systems differently.⁵³ What we have now was not inevitable. Contract law still can be different. The technological systems through which we interact, communicate, transact, and form relationships also could be different. They are designed and, in fact, optimized to obtain predetermined results given the legal and technological constraints and the predictable behavior of visitors. The technological systems reflect a series of design choices in their deployment, in their architecture. Contract law has permitted and perhaps encouraged the development of an electronic contracting environment in which it would be irrational for users to read the terms of the contract. The technological design of the user interface — a click to agree button coupled with a link to a separate file with potentially endless pages of terms — is merely an implementation of what contract law has allowed. It is efficient, in a sense.

Each online contract we mindlessly enter into is presumably in our interest and cost-benefit justified. Otherwise, we'd have chosen to abstain. The terms of the transaction that matter are not usually in the contract anyway. Price and service are presumably the driving factors.⁵⁴ All else is a mere transaction

53 Margaret Radin argues that as contract law has evolved to accommodate the mass market and electronic contracting, the meaning of consent has been devalued. MARGARET JANE RADIN, *BOILERPLATE: THE FINE PRINT, VANISHING RIGHTS AND THE RULE OF LAW* 33 (2013). She points to specific practices in contracting that compel parties to consent to less than favorable conditions and ultimately deprive parties of rights under contract. For example, choice of forum clauses that force litigation to occur far from parties, exculpatory clauses, adhesion contracts, offsite terms and shrink-wrap licenses all heighten the imbalance of power for consumers. *Id.* at 6, 10-11.

54 But what if the true price is not money exchanged? What if the actual price users pay for the services provided by websites they visit is information collected by the site about the user? What if the relevant relationships being formed when users visit the website extend beyond the website and users to include third parties, such as advertisers or affiliates of the website? Are the users' relationships with such third-party beneficiaries also governed by contract law?

cost to be minimized, buried in terms of service that no rational person would read. You retain your autonomy, of course, and may choose to leave, but that's it. Take it or leave it. It is quite simple.

Our current online contracting regime is a compelling example of how our legal rules coupled with a specific technological environment can make us behave like simple machines — perfectly rational, of course, but also perfectly predictable and, ultimately, programmable. The environment disciplines us to go on autopilot and effectively helps create dispositions that will follow us through other walks of life, at least, walks of life that involve similar technological environments, which may turn out to be all walks of life.⁵⁵ Consider how the electronic contracting environment optimized for websites has migrated to mobile devices and further to smart televisions and other contexts. The parties, legal relationships, technologies, data, and implications vary dramatically across these contexts,⁵⁶ but the behavior doesn't.⁵⁷ Perfectly predictable, stimulus-response, check the box, click "I Agree." This is perfectly rational behavior, and thus, presumably, efficient. (If for a moment you hesitate and decide to investigate the privacy policy for your smart TV, you'll likely see the "1/50" at the bottom of the screen and then shrug, click the back arrow, and behave — as you're supposed to.⁵⁸)

55 This is an empirical claim that requires testing. I do not yet have empirical evidence to support the claim. It is based entirely upon anecdote and informal surveys of students and audiences.

56 Just think for a moment about how the relationships and privacy implications differ when you shift from website to Smart TV. There are different service providers, different third-party affiliates in the background, different technologies and services, and different types of data. The Smart TV might be in your living room, and it might even have a microphone (for those karaoke sessions). Others have diagnosed the problem; that is not my task here. I only want to emphasize how the stimulus-response mechanism works similarly despite how very different the implications might be.

57 Again, this is an empirical claim that requires testing. I do not yet have empirical evidence to support the claim. It is based entirely upon anecdote and informal surveys of students and audiences.

58 Of course, the behavior of not reading contract terms is not new. For example, bank and insurance contracts are notoriously long and filled with incomprehensible legal jargon, and consequently customers tend to sign them without thoroughly reading or understanding them. Additionally, electronic contracting on the Internet has led to the development of creative ways to get parties to agree to terms they have never seen. Radin points to the "unwitting contract," where websites have a link to a separate webpage containing terms of service:

If one were to click on it, which most users don't (in fact, most probably don't even notice the link), one would see pages of boilerplate open out, telling the

You might resist my characterization because you believe that you really decide for yourself and are in no way programmed.⁵⁹ This seems a common and natural reaction. I know it was mine at first, and many others have had that reaction when I've presented an earlier version of this Article. We might rationalize our behavior, for example, by supposing that we consciously adopted a strategy at some point in our past, that we deliberate once in a while, or that we decided to trust in the wisdom of crowds and the idea that someone would check for egregious terms. These seem like reasonable explanations.

Evaluating whether you in fact decide for yourself is a difficult empirical question, which is not answered simply by asking for your own self-assessment. The empirical question is complicated by the fact that the optimized environment may be architected to make you feel as though you have chosen in a deliberate manner. This is one difficulty with evaluating techno-social engineering from an internal, subjective perspective; self-reporting and evaluation by those within the environment and subject to engineering is not exactly trustworthy. Another complication concerns the very definition of choice and whether it matters if the environment has nudged you from System 2 to System 1 thinking or has encouraged your reliance on a particular heuristic.⁶⁰ Ironically, the electronic contracting environment is designed to stimulate System 1 — instinctive, heuristic thinking — yet it may appear or even feel as though one is engaging System 2 — rational deliberation; the behavior is, after all, perfectly rational.⁶¹

user that she is bound to these terms, that she has “agreed” to them simply by the act of looking at the site, and moreover the owner may change the terms from time to time and that the use will then be bound by the new terms as well. RADIN, *supra* note 53, at at 11-12. Moreover, the frequency of consumer engagement with electronic contracts is one important distinguishing feature.

59 You might also resist my characterization on empirical grounds. *See supra* notes 55, 57 (acknowledging the need for empirical testing of these claims).

60 The terms System 1 and System 2 thinking originate in “dual process” theories of cognition, recently popularized by Daniel Kahneman, the Nobel Prize winning behavioral economist. *See* DANIEL KAHNEMAN, *THINKING, FAST AND SLOW* (2011). Dual process theory explains how an experience can occur as a result of two different cognitive processes, or two different systems: System 1 experiences are “fast, automatic, effortless, associative, and often emotionally charged”; System 2 experiences are “slower, serial, effortful, and deliberately controlled.” Daniel Kahneman, *Maps of Bounded Rationality: A Perspective on Intuitive Judgment and Choice*, *LES PRIX NOBEL: THE NOBEL PRIZES* 449 (2002), http://nobelprize.org/nobel_prizes/economics/laureates/2002/kahnemann-lecture.pdf.

61 *See* RADIN, *supra* note 53, at 26-29 (describing how heuristic bias, or status quo bias, encourages individuals to “stick with what we’ve done before,” making the act of accepting a contract by clicking “I agree” completely rational).

The electronic contracting environment example may provide a glimpse at how a series of incremental steps aggregate. The Facebook emotional contagion experiment and activity watch story were such incremental steps; we extrapolated with extensions and had to speculate. But the electronic contracting environment example shows how techno-social engineering of humans might work and what might be the consequences of heading down that path. Assume for a moment that my characterization is correct — that the electronic contracting environment effectively programs human beings to behave like simple machines, perfectly rational, predictable and programmable. If true, that would only trigger evaluation. While some might argue that such techno-social engineering is dehumanizing and thus normatively unacceptable, others might argue that it is not dehumanizing and is in fact humanizing because it efficiently saves time and resources and allows humans to pursue other interests (than reviewing contracts!). I take no position yet on this normative debate. I aim only to draw attention to it. Note how the normative debate only occurs if and when we recognize the path we are marching on.

CONCLUSION

If you are familiar with the boiling frog soup story, then you could probably smell it coming.⁶² Do you know how to make frog soup? If you begin with a live frog, you cannot just drop it into a pot of boiling water because it will jump out. You need to place the frog in a kettle of room temperature water and increase the temperature of the water slowly enough that the frog doesn't notice it's being cooked. "As the water gradually heats up, the frog will sink into a tranquil stupor, exactly like one of us in a hot bath, and before long, with a smile on its face, it will unresistingly allow itself to be boiled to death."⁶³ The story often is used as a metaphor to comment on the difficulties we face in dealing with the gradual changes in our environment that can have drastic, irreversible consequences. The gradual change may be difficult to identify, or each incremental step, or change in temperature, may in the moment seem desirable. The benefits seem to exceed the costs. The end state may be difficult to anticipate or comprehend, and in the end, it may not seem to matter. After all, it doesn't really matter (to the frog) whether the frog knows at the end

62 On the boiling frog metaphor, see *Boiling Frog*, WIKIPEDIA, https://en.wikipedia.org/wiki/Boiling_frog (last modified Dec. 9, 2015). Frogs do not actually behave as the story suggests. Nonetheless, as Eugene Volokh noted, the metaphor is useful conceptually, regardless of how frogs actually behave. Eugene Volokh, *The Mechanisms of the Slippery Slope*, 116 HARV. L. REV. 1026 (2003).

63 DANIEL QUINN, *THE STORY OF B 258* (1996).

that it is frog soup or whether the soup is tasty and nourishing. What matters (to the frog) is the fact that the water temperature is rising slowly, how that occurs, who controls the heat, and perhaps even why? Had the person in control of the heat turned it up too quickly, the frog might be alerted to the danger and escape, but those who aim to cook frog soup know better than that.

I admit that the metaphor fails at this point because there is not necessarily a single cook, master planner or designer. Rather, we may be doing this collectively as we participate on Facebook, attach devices to our children, and casually nudge each other down the path we are on. That said, the techno-social engineering tools are architectural and powerful, and the tools can significantly concentrate power. Important distributive justice issues lurk beneath the surface.

In addition, the boiling frog metaphor paints a dystopian picture; the end-state is death, after all. But there are other possibilities, and many incremental steps may be worth taking. Rather than attempt an equilibration to balance the dystopian with utopian imagery, let me emphasize the main point, which is not the dystopian end-state; the main point is that we need to pay attention to the basic humanistic and constitutional questions, and we need to develop much better tools for identifying and evaluating our humanity and evolving relationships with technology and environment.

