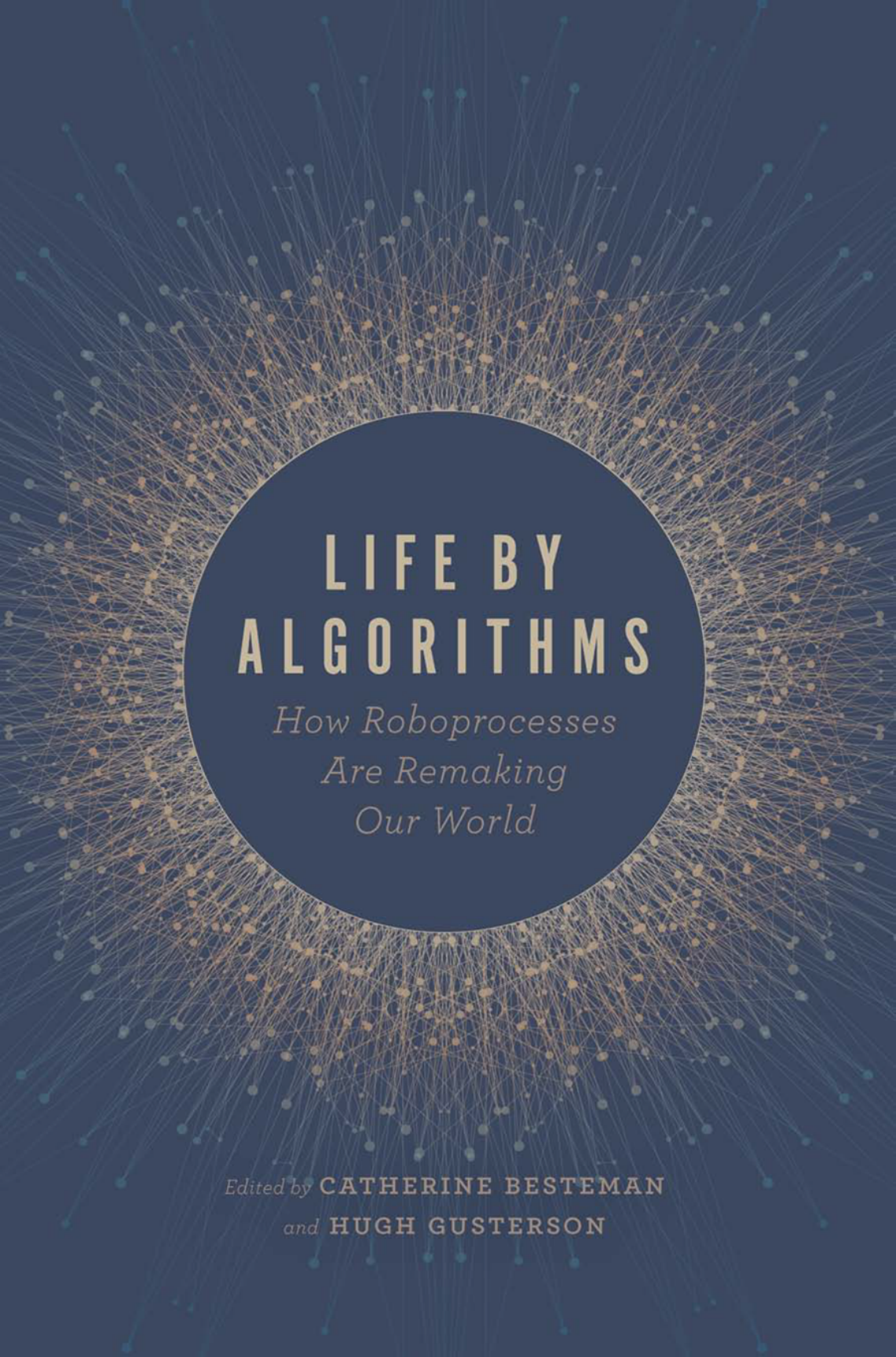
LIFE BY ALGORITHMS
How Roboprocesses Are Remaking Our World
Edited by CATHERINE BESTEMAN and HUGH GUSTERSON

Life by Algorithms

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Contents

INTRODUCTION

Robohumans

HUGH GUSTERSON

> The discussion of culture is being steadily absorbed into the discussion of business. There are "metrics" for phenomena that cannot be metrically measured. Numerical values are assigned to things that cannot be captured by numbers. Economic concepts go rampaging through noneconomic realms: Economists are our experts on happiness! Where wisdom once was, quantification will now be. Quantification is the most overwhelming influence upon the contemporary American understanding of, well, everything. It is enabled by the idolatry of data, which has itself been enabled by the almost unimaginable data-generating capabilities of the new technology. The distinction between knowledge and information is a thing of the past, and there is no greater disgrace than to be a thing of the past. Beyond its impact upon culture, the new technology penetrates even deeper levels of identity and experience, to cognition and to consciousness.
>
> LEON WIESELTIER[1]

> Bureaucracy is a giant mechanism operated by pygmies.
>
> ATTRIBUTED TO HONORÉ DE BALZAC

Some years ago, when my bank was bought by Bank of America, I decided to close my account and open a new one at a local community bank. In the following months I continued to receive mailings from Bank of America, but, since I was no longer a customer, I treated them as junk mail and did not open them. Then, after several months, I was contacted by a debt collector who told me I had a debt to Bank of America that had to be paid. I went and asked the branch manager to explain what had happened. The manager scrolled and clicked on his computer screen for several minutes, then looked up. "After you closed your account, there was a final interest payment of thirteen cents, so the computer reopened your account and put the thirteen cents in it. But we charge a fee to customers with low balances. You've been incurring fees for several months, and you haven't been paying them. So your account was sent for debt collection." The Bank of America computers had created what is known in the trade as a "zombie account."

The manager, an immigrant from West Africa, was sympathetic about the Kafkaesque quality of some banking practices in his adopted country, and

he agreed that I should not have to pay the bank. As I watched him try to rectify the problem, the manager got visibly more frustrated. The computer would not allow him to override the recorded debt. He picked up the phone and called a number in New York. He was referred to another number. Then another. I listened as he spent maybe twenty minutes talking to invisible functionaries in New York, acting more like a supplicant than a manager, explaining what had happened and seeking someone who could expunge the spurious debt from the system.

This is a classic example of a *roboprocess*. This interaction was driven by computerized processes which, while supposedly the embodiment of a rational system, in this instance produced an absurd outcome that defied common sense. I, the customer, ostensibly served by the system, was trapped within it. The operators of the system, supposedly its masters, are disempowered, and it becomes hard to find anyone who has the authority to override the system's flaws. The algorithmic processes that underlie it take on a life of their own, and the distribution of responsibility between actors who do not coordinate with each other obstructs adjustment of the apparatus to instances that do not conform to stereotyped scenarios. The common sense and situational logic of humans is displaced by and subordinated to the logic of automation and bureaucracy.

Although my experience with a banking roboprocess was annoying, the mistake was remedied. But for a couple whose story was told in the British newspaper the *Guardian*, their encounter with roboprocesses at Wachovia Bank (now part of Wells Fargo) turned deadly. In 2007 Norman and Oriane Rousseau were persuaded by a Wachovia loan officer to refinance the mortgage on their house in California. Two years later "they received a statement saying April's payment had been missed. The Rousseaus faxed off repeated copies off the receipt they had got from the teller and continued to make payments of $1,615. But they started getting phone calls—as many as eight a day—from Wachovia's collection arm." Even after they spoke to a Wachovia officer who said their account was current, they still got letters demanding payments and threatening foreclosure. After a lawyer they retained found that the loan officer had falsified their income on the loan paperwork, they applied to have the mortgage readjusted in addition to being credited properly for what they had already paid. For months the bank refused to approve or reject their request for an adjustment, saying they had not received certain information—although it had already been sent several times. When the Rousseaus phoned the bank, they were invariably put through to different people. "Each one always told a different story, or insisted certain information

needed to renegotiate their loan had not been received, even though the Rousseaus' lawyers had sent it, often multiple times. 'Every time we talk to someone they did not know what the person did before them. Or they did not care. It was like talking to a wall,' Oriane said." Then the bank gave them two days to pay $26,000 (including $4,000 in late fees) or lose their home. Having scrambled unsuccessfully to liquidate their retirement accounts in two days, they lost their home and Norman shot himself dead.[2]

These two examples from the banking world concern situations that are heavily mediated by computerized systems of record keeping and adjudication. In my own case I was lucky to find a resourceful manager who took responsibility for the problem and was determined to fix it; Norman and Oriane Rousseau, fighting the banking system a few years later, at the height of the financial crisis, were not so lucky. Bureaucratic stonewalling and the personal unaccountability of organizational representatives, such that interactions can feel "like talking to a wall," are common features of these kinds of roboprocesses. They often leave customers wondering whether they are dealing with systems that are simply rigid, clumsy and unaccountable, or whether these systems are deliberately set up to obstruct and defraud customers.

Roboprocesses are everywhere in our society. Many are mundane, and they have become so routinized that we hardly notice them: calling a business and being told to press one for this and two for that; or being forced by an automated system to change a strong password we can easily recall for an obscure password with bizarre characters we cannot remember.[3] Applicants to universities who are defined by their SAT scores and applicants for mortgages who are defined by their FICO Scores are inside roboprocesses, as is the criminal defendant whose sentence is predetermined by the precise weight of the amount of cocaine found in his car which, under sentencing guidelines, counts for more than his personal history and circumstances. So also is the medical patient whose treatment is, whether she knows it or not, driven by algorithms that regulate diagnoses and the reimbursement relationship between doctors and insurance companies. And many of those people who lost their houses and jobs in the Great Recession did so in part because banks followed investment algorithms. Then, as Noelle Stout vividly describes in chapter 1 of this book, desperate homeowners who needed to renegotiate their mortgages after the crash in the housing market were confronted with impersonal banking bureaucracies imposing inflexible rules; like Norman and Oriane Rousseau, they could not find reasonable, empowered human interlocutors with whom to negotiate, as they might have when mortgages were held by the local bank on Main Street.

Robohistory

The pervasive, strangulating grip of what we call *roboprocesses* in this volume is, obviously, rooted in the emergence and maturation of bureaucratic forms of administration in the nineteenth and twentieth centuries. As the social theorists Max Weber (writing in the early twentieth century) and Michel Foucault (writing in the late twentieth century) have explained, in this era monarchical forms of authority based on charisma and the discretionary power of the individual sovereign (and his or her lieutenants) gave way to more abstract and impersonal forms of authority. These impersonal forms of authority valorized the categorization of people and tasks, fetishized paperwork, and sought to regulate populations through standardized, rationalized routines. Authority now came to lie not with the will of the sovereign but with administrative codes and routines whose legitimacy derived from their abstract orderliness and rationalized consistency. Weber admired bureaucracies' aspiration to apply a uniform set of rules with consistency and impartiality, calling bureaucracy "superior to any other form in precision, in stability, in the stringency of its discipline, and in its reliability." Weber averred that "the great virtue of bureaucracy—indeed, perhaps its defining characteristic—was that it was an institutional method for applying general rules to specific cases, thereby making the actions of government fair and predictable."[4] Foucault, on the other hand, saw in bureaucratic rationality an impersonal, bloodless, and oppressive disciplinary system that thrived on surveillance, defined individuals against pernicious ideals of "the normal," and, once internalized, enforced mass obedience and conformity.

The anthropologist Michael Herzfeld also takes issue with Weber's idealized narrative of bureaucratic rationality. He begins his book on the "social production of indifference" in bureaucracies by pointing out that "everyone, it seems, has a bureaucratic horror story to tell," and asks how it is that bureaucrats so often invoke abstract rules to trample common sense and behave with petty cruelty toward plainly deserving supplicants on the other side of the desk.[5] He argues that part of the answer lies in bureaucrats' trained fetishization of the rules as a sort of devotional object to which flesh-and-blood humans must sometimes be sacrificed. But he also points out that the organizational structure of bureaucracies is one of unaccountability and "buck-passing" in which decisions "get made" rather than being the responsibility of individual moral actors. "While disgruntled clients blame bureaucrats, the latter blame 'the system,' excessively complicated laws, their immediate and more distant superiors, 'the government.'"[6] When we look in more detail at roboprocesses, we will see that they amplify this feature of unaccountability in bureaucratic processes by automating it.

David Graeber, an anthropologist who was one of the leaders of the Occupy movement, argues in his book *Utopia of Rules* that such bureaucratic modes of administration over the last century have been as characteristic of business as of government. Over time, government and corporate bureaucracies and regulatory regimes became symbiotically fused. Graeber observes that, in what he calls "the age of total bureaucratization," one can see the effects of this public-private hybrid bureaucracy "in every aspect of our lives. It fills our days with paperwork. Application forms get longer and more elaborate. Ordinary documents like bills or tickets or memberships in sports or book clubs come to be buttressed by pages of legalistic fine print . . . This alliance of government and finance often produces results that bear a striking resemblance to the worst excesses of bureaucratization in the former Soviet Union or former colonial backwaters of the Global South."[7] Meanwhile, as our economy and society become more and more bureaucratized, a bureaucratic aesthetic develops whereby "the algorithms and mathematical formulae by which the world comes to be assessed become, ultimately, not just measures of value, but the source of value itself."[8]

In keeping with his own anarchist politics, Graeber emphasizes the evils and dysfunctions of bureaucracy: the ways it interferes with personal freedom, generates legions of what Graeber calls "bullshit jobs" for paper pushers, and clogs up daily life, often generating irrational outcomes in the process. So it is important to bear in mind, as Weber himself emphasized, that there is an idealistic impulse underlying much bureaucracy: the ideal that everyone will be treated equally, fairly, and in accordance with rationally configured administrative procedures. In a utopia of rules, everyone who applies for a job, for a bank loan, or for a place at the best university should be judged on their merits according to a clearly specified set of uniform rules, not according to who their parents are or whom they know. Thus many of the roboprocesses that now seem most abusive were defended at an earlier time on the basis of their ability to enforce fairness: borrowers' access to mortgages would be determined by objectively derived credit scores rather than a local bank manager who was prejudiced against women and minorities; criminal defendants' sentences would be driven by objective criteria rather than doled out by judges determined to lock up black men; and employees' raises would be calculated by uniform, transparent criteria of merit rather than the favoritism of their bosses.

What we call *roboprocesses* in this book are deeply rooted in bureaucratic codes of rationality and discipline of the kind theorized by Weber and Foucault, but they exceed them. Roboprocesses came into their own from the 1980s onward as bureaucratic protocols were intensified and automated through computerization in a moment of political economic transition where

neoliberalism, a more virulently extractive form of global capitalism, supplanted the Keynesian-Fordist form of capitalism that had hitherto characterized the Cold War era, especially in the United States. The conjuncture in time of the move to computerize daily life in the West with the rise of neoliberalism assured that the computer-driven algorithms developed by governments and corporations would be used aggressively to discipline and objectify citizens, employees, and consumers and to mine them for profit.

It is hard to imagine roboprocesses absent computers. Computers enable the storage, sorting, and analysis of massive amounts of information, as well as the automation of decision making.[9] Computers operate the automated phone systems with which corporations have replaced so many human operators; they enable governments to track the actions of millions of people so as to develop lists of potential terrorists; they facilitate the algorithms that underlie credit scores, insurance rates, and university rankings; and they crunch the data that Facebook, Amazon, YouTube and Google use to decide what you will be prompted to look at and in what order. More deeply, however, computers offer a model of cognition that increasingly shapes our approach to the world, even when computers are not directly involved in information processing. Experts on artificial intelligence like to debate whether and when computers will be able to think like human beings when, in reality, human beings are learning to think more and more like computers. Thus, for example, the imposition of sentences under "three strikes and you're out" legislation hardly requires computers for its execution, but protocols of automated logic are clearly implicated in the notion that criminality can be quantified and penal consequences calculated according to a formulaic code. Computers apply algorithms and so, increasingly, in the age of computers, do humans.

It would make an interesting thought experiment to imagine a fusing of bureaucracy and computers that was human-centered. In this counterhistory the algorithms used to regulate social and economic decisions would be transparent and debatable, and citizens would have free access to and control over the data collected about them; and system designers would work with customers and citizens, not just with government and corporate elites, to create processes that were responsive to those caught up in them. This, of course, is not the history we got, and part of the reason for that is that the digital automation of bureaucratic protocols took place in the context of the rise of neoliberalism.[10]

What is neoliberalism? Different commentators emphasize different aspects of this complex, still evolving phenomenon—its empowerment of the banking sector over the manufacturing sector; its use of complex, almost

illegible financial maneuvers to generate huge profits in short periods of time for small elites; its cold-eyed search for inefficiencies that can be wrung out of economic systems to increase marginal profits; its penchant for creating insecurity by undermining long-term employment contracts and retirement plans; its ruthless eagerness to move capital and jobs around the world in the service of ever greater profit margins; its attack on regulatory systems; its shift of risk from nations, corporations, and local communities to individuals; its commodification of things that used not to be bought and sold (water, weather futures, human eggs, surrogate wombs, browsing histories, and more);[11] and the deepening inequality—captured by slogans about the "1 percent"—it leaves in its wake as trade unions, pension schemes, welfare systems, and Cold War notions of national community weaken and crumble. For our purposes here, it is useful to emphasize ways in which neoliberalism is an information-age heir to "scientific management" approaches a century earlier. It increases profit margins and amplifies social control of citizens, consumers, and employees by collecting as much data about them as possible, while establishing protocols and algorithms that channel their behavior, incite them to be more productive, and constrain their freedom to deviate from scripts of normality. The data collected can be commodified and sold (think of what Google does with your online searches); used to increase the efficiency of transactions (Amazon counts the steps each worker takes when packaging an item[12]); analyzed to squeeze more marginal profit from the system (the price you are quoted for a plane trip may depend on your recent online purchases[13]); or used to construct profiles that make it hard for certain kinds of people to get mortgages, jobs, or prison parole.

Thus the conjuncture between computerization and neoliberalism has produced roboprocesses skewed in favor of corporate profit making, mass surveillance, and the retrenchment of racial and class-based inequalities. The result has been automated phone systems and checkout systems in stores that frustrate customers but enable corporations to increase profits by laying off staff; a shadowy and unaccountable empire of companies selling profiles of consumers, patients, and borrowers; a justice system whose algorithms disproportionately penalize racial minorities and the poor; workplaces that judge employees not for their individual achievements but for their degree of conformity to an algorithmic approximation of the ideal employee; doctors who spend more time looking at computer screens and doing paperwork than touching patients; and teachers who worry more about test scores than the needs of the flesh-and-blood students sitting in front of them.

Robocritiques

Critiques of social algorithms and big data abuses—phenomena overlapping and closely related to what we call *roboprocesses*—have begun to emerge since the beginning of the twenty-first century. They have largely been penned by information scientists, legal scholars, media critics and journalists rather than—as is mostly the case in this volume—anthropologists. We believe that anthropologists, with their unique ability to understand behavior in context, to spot cultural patterns passing themselves off as rational choices, and to evoke the human cost of social practices through vividly told stories about ordinary people, have a special contribution to make in carrying this discussion forward.

Perhaps the best-known popular critic of the kinds of processes that interest us in this book is Cathy O'Neil. O'Neil is a mathematician who worked on Wall Street as a data analyst, became disillusioned, joined the Occupy Wall Street movement and turned to writing critically about big data for a popular audience. Her blog mathbabe.org and her book *Weapons of Math Destruction* have, justly, earned her a substantial audience. O'Neil is by no means opposed to all uses of big data. She points out, for example, that top-ranked baseball teams have used a careful analysis of successful and unsuccessful plays by those on their own and opposing teams to steadily improve their performance, and Amazon has continually improved its ability to understand customer preferences by painstakingly tracking and analyzing every click, whether it leads to a sale or not. The key to success, she says, is to keep measuring as much as possible, successes and failures alike, to collect massive data sets, and to search for patterns and correlations that can continually be tested and improved as more data are collected with each iteration. She contrasts this approach with that of what she calls "weapons of math destruction" (WMDs). These are algorithms, often deliberately opaque to outsiders, that inflict real social damage when they underestimate the complexity of the real world, mistake partial samples for comprehensive data, and create feedback loops that the algorithms' designers confuse with independent human behavior. Such algorithms become particularly damaging at large scale—when they are so widely adopted that they become pervasive reality distortion fields. Examples O'Neil gives of WMDs include the algorithms that regulate teacher promotions, lending and hiring decisions, and community policing.

As an instance of a WMD that mistakes a small, partial data set for a well-rounded and sufficient statistical sample, O'Neil cites the opaque algorithm that Princeton-based Mathematica Policy Research designed for the Washington, DC, school district when Michelle Rhee, a fervent advocate of educational

metrics, took over as chancellor in 2007. The algorithm took students' standardized test scores at the end of one school year and compared them with standardized test scores a year later to determine whether the teacher that year was "good" or "bad" and should be rewarded with a raise or laid off. (In a single year, 2011, 206 teachers were fired in Washington, DC, on the basis of this formula.) O'Neil points out that Google would try to discern the impact of a single variable—say, the color or font of a search result—by varying it methodically across thousands, even millions, of interactions and tracking correlations in a complex field where dozens of discrete variables might affect online behavior and discerning the effect of a single variable would require a large, carefully analyzed data set. In the Washington, DC, school system, one teacher is a single variable interacting in complicated ways with many others, so "attempting to score a teacher's effectiveness by analyzing the test results of only twenty-five or thirty students is statistically unsound, even laughable. . . . If we were to analyze teachers with the statistical rigor of a search engine, we'd have to test them on thousands or even millions of randomly selected students."[14] Yet this impoverished algorithm was allowed to end the careers of some talented teachers, misallocate raises to teachers and principals, and shape the ways teachers approached their vocation. And it leaves us wondering how a government bureaucracy could be so eager to adopt an algorithmic tool whose unreliability should have been clear to anyone who had taken Statistics 101. Was the point really to identify underperforming teachers or to create a culture of insecurity in which teachers constantly feared for their jobs?[15]

Even more disturbing is O'Neil's analysis of algorithms used to predict the geographic distribution of urban crime. These algorithms, used by police chiefs and other policy makers to allocate police resources, have led officials to mistake the feedback loops that the algorithms themselves have created for objective readings of the urban crime landscape. "Risk terrain analysis" computer programs with names like "HunchLab" and "PredPol" (the latter developed by an anthropologist at UCLA) map the locations of crimes in official crime reports and use these locations to find correlations and predict the geographic distribution of future crimes. But the designers seem not to have given much thought to how crime statistics are produced. As O'Neil points out, while the police are out in force in poor neighborhoods, stopping and frisking people on the basis of currently trendy zero-tolerance theories and thus generating crime reports, in wealthy neighborhoods crime is almost certainly underreported. If the police blanketed rich neighborhoods, they would find jaywalking, drivers not coming to a complete halt at stop signs, people not picking up after their dogs, illegal drug use in homes and bars, spousal abuse, and financial fraud that currently slip under the radar. Instead, the police are out on the other side of the

tracks looking for young black men with small bags of marijuana in their backpacks or broken taillights on their cars. As a result, with an unseen circularity, the algorithms tell police that crime is concentrated in poor neighborhoods. "That's where it is, they say, pointing to the highlighted ghetto on the map," O'Neil states. "And now they have cutting-edge technology (powered by Big Data) reinforcing their position there, while adding precision and 'science' to the process. The result is that we criminalize poverty, believing all the while that our tools are not only scientific but fair."[16]

Frank Pasquale, a law professor who has also become known as a leading critic of the uses of algorithms in American society, is particularly concerned about the effects of feedback loops on credit scores. Pointing out that "a poor credit score may cost a borrower hundreds of thousands of dollars," he observes that "an unemployed person with a poor credit history, not necessarily through his own fault, is likely to find it harder to find the work needed to earn the money to pay off his debts. If he fails to, his credit history will further deteriorate, his interest rates will go up, and a vicious cycle ensues."[17] Soon, Pasquale adds, "small mistakes can cascade into life-changing classifications."[18] The scores from these computer programs, which O'Neil likens to "dictates from algorithmic gods,"[19] have the power to become destiny.

A number of commentators have observed that members of racial minorities are especially likely to be disadvantaged by the kind of feedback loops that worry O'Neil and Pasquale. Law professor Lori Andrews refers to this phenomenon, by analogy with "redlining," as "weblining."[20] In the afterword to the present volume, Catherine Besteman discusses a particularly troubling study by Latanya Sweeney, formerly chief technology officer for the U.S. Federal Trade Commission, who found that internet searches for people with stereotypically African American names were significantly more likely to generate suggestions to investigate the person's criminal history. Sweeney comments, "'Have you ever been arrested?' Imagine this question appearing whenever someone enters your name in a search engine. Perhaps you are in competition for an award, a scholarship, an appointment, a promotion, or a new job, or maybe you are in a position of trust, such as a professor, a physician, a banker, a judge, a manager, or a volunteer. . . . Appearing alongside your list of accomplishments is an advertisement implying you may have a criminal record, whether you actually have one or not."[21] Most analysts suspect that such racially toxic search results were not deliberately programmed into the algorithms. Instead, they are the result of the algorithms used by Google and others gradually adjusting as they learn from click patterns in millions of online searches. In other words, the racial skew in U.S. patterns of incarceration and the racial prejudices of some internet users may have

gradually baked themselves into internet search results, further disadvantaging African Americans seeking jobs, loans, apartment rentals, and so on.

Pasquale accuses search algorithms of "black boxing" prejudice and is particularly troubled by the opacity of the algorithms that regulate our lives and the unaccountability of the algorithms' designers. "Credit scores, search engines, major banks and the TSA [Transportation Security Administration] take in data about us and convert it into scores, rankings, risk calculations, and watch lists with vitally important consequences," observes Pasquale. "But the proprietary algorithms by which they do so are immune from scrutiny except on the rare occasions when a whistleblower litigates or leaks."[22] Pasquale points out that when Amazon recommends a book, we have no way of knowing whether it is responding primarily to our browsing history or to a payment from an advertiser; when an automated personality test eliminates us from a job applicant pool, the workings of the test are inscrutable; and when Google gives us a list of restaurants, we have no way of knowing the ranking criteria used, nor of asking Google to weight its rankings in favor of restaurants that treat their employees well. Computerized algorithms have taken the buck-passing and unaccountability that Michael Herzfeld identified as endemic to bureaucracies and have automated and black-boxed them.

Pasquale says we will not understand the workings of these algorithms and the hidden ways they track and manipulate us absent leaks by insiders in the organizations that own them. As it happens, in the case of Facebook, we have such leaks from Antonio García Martínez, a former senior manager who became disillusioned with Facebook's unaccountability to the broader society.[23] Martínez dropped out of Silicon Valley, penned the memoir *Chaos Monkeys*, and now writes a regular column for *Wired* online magazine.[24] Since leaving Facebook, he has revealed ways in which Facebook's algorithms may have benefited Donald Trump (whose campaign, unlike Hillary Clinton's, employed a number of former Facebook operatives and was able to draw on their privileged knowledge of the social media giant). Martínez revealed that Facebook charges less for ads that generate "engagement"—shares, likes, angry emojis, comments. "Provocative clickbait gets a big discount,"[25] and, as well as being charged at a lower rate, it gets moved higher up in newsfeeds because it generates reactions. It is not hard to see how this feature of Facebook's business model would have helped candidate Trump, together with the use of "bots" on Twitter and fake accounts, unpoliced by Facebook, that disseminated "fake news" in a way that is presumed to have distorted the political perceptions of some social media users.

Beyond that, we should be concerned about the detailed data mining, revealed by Martínez, in which Facebook has been engaged through its Custom

Audiences and Lookalike Audiences tools. The Custom Audiences tool combines data Facebook collects from its customers' clicking and posting patterns with data from the outside world scraped from mailing lists, supermarket loyalty programs, and records of political contributions, for example. The resulting profiles, which may include phone numbers, are then sold to anyone who wants to buy them, including political campaigns. The Lookalike Audiences program then "vastly expands a potential target group by using algorithms to search for profiles with characteristics similar to a Custom Audience, thus spreading a message to as many like-minded people as possible."[26] This might not be what Facebook customers had in mind when they opened accounts so they could share their latest news with family and friends.

The European Union's General Data Protection Regulation, which went into effect in 2018, imposes some restraints on such activities and offers a model for how regulators might push back on roboprocesses. To comply with the new regulation, Facebook (as well as other social media companies) now has to show users what information it has stored about them, ask consent through a clear, user-friendly interface before sharing users' personal information, disaggregate consent to multiple kinds of data tracking so that users consent to each kind individually, and give users an easy way to remove certain kinds of information from their profile.[27]

But, going forward, we should be concerned not only about the direct tracking of our every online move by such voracious data hogs as Amazon, Twitter, Google, and Facebook but also by even more comprehensive, but less visible, forms of "dataveillance"[28] that involve the aggregation and cross-referencing of data from disparate sources to discern things about us we might reasonably have thought private. This data mashing from disparate sources is conducted by government "fusion centers" that combine government camera records,[29] traffic tickets, tax records, driver's license information, crime reports, utility bills, credit reports, charitable donations, and blog posts to create a comprehensive composite profile of a person. The most detailed profiles are often of political activists.[30] Government agencies circumvent laws that protect the government from collecting certain kinds of data on citizens by outsourcing the work to private contractors.[31]

The commercial sector also engages in this kind of data fusion. The Target store chain created a "pregnancy prediction score" based on what it knew of purchasing patterns by expectant mothers (who tend to buy calcium supplements, scent-free soap, and lots of cotton balls) and used this data result to send targeted ads to customers it thought were pregnant.[32] Similar programs were developed by other companies to compile lists of people presumed to have cancer, depression, or diabetes and to predict the sexual orientation of

customers. And, using the power of big data to circumvent medical privacy laws, health insurance companies purchase records of drug prescriptions, online searches for particular health conditions, and so on to build a health profile that may be used to determine your insurance rate.[33]

Roboprocesses

With these critiques as background, in this book we look from a more anthropological perspective at the structural anatomy of what we call *roboprocesses* and at the ways in which they are reshaping the struggle for material security, the experience of identity, and the landscape of institutional power in contemporary society. Many newly powerful organizations—credit rating bureaus, educational testing companies, anonymous contractors that review applicants for security clearances, and information technology (IT) consulting companies, for example—lie outside the list of big corporations and government agencies that are conventionally understood to be powerful in late modern society, so it is all the more important that we understand the way they function. Here we describe six important features of roboprocesses.

First, *roboprocesses deskill employees of organizations*. Barbara Garson, whose book *The Electronic Sweatshop* examined the first wave of workplace computerization in the 1980s, explored the application of digital algorithms to a range of jobs from fast food worker and airline reservations agent to social worker.[34] Garson wrote about the ways computer programs and algorithmic work routines turned work tasks into standardized units that could be measured, compared, and broken down into repetitive tasks that sap employees of initiative, and force them to constantly attend to their efficiency rather than the quality of their work, while shifting the locus of decision-making power from employees to the unseen authors of the scripts they follow. Garson gives the example of social workers whose supervisors wanted them to focus less on the variable needs of individual clients and think of themselves instead as delivering standardized services by measured unit. They were to be paid accordingly. Thus, for example, they were allocated three-tenths of an hour to issue a food stamp identification card, seven-tenths of an hour to authorize funeral expenses, and so on.[35]

Doctors offer an analogous story. Not only is a doctor's reimbursement tied to standardized expectations of how long a particular procedure or interaction should take, but physicians are also required to follow diagnostic algorithms set up so that "any single word a patient utters may set off a long cascade of programmed activity. These algorithms tilt the locus of diagnosis and judgment from your doctor to his database. Thus people who say 'fever'

and 'cough' are likely to find themselves being evaluated and treated according to a 'pneumonia' algorithm; a mention of 'chest pain' will land them on a 'heart attack algorithm.' "[36]

Frederick Taylor, the inventor of time-and-motion studies and "scientific management" in the late nineteenth century, wrote that "all possible brain work should be removed from the shop and concentrated in the planning or laying out department."[37] Carrying this principle forward a century to the roboprocessed workplace, algorithmic deskilling shifts power and initiative from those who execute tasks in the workplace to a new roboelite of consultants, IT workers, programmers, and systems analysts. It may also lead to the creation of a subelite, a sort of worker aristocracy, of what Garson calls "exception workers." As she puts it in her discussion of "the automated social worker," "when a front-line service job, the rank that first meets the customer, is reduced to a clerical function, it's often necessary to create a smaller second rank of better-treated and better-trained workers. These supervisors, ombudsmen or exception workers must be permitted enough discretion to deal with special problems that the lower-level clerks are no longer allowed to handle."[38]

Given the dysfunction rigid roboprocesses can create when people get stranded in data loops or trapped in binary choices that mismatch their circumstances, in practice organizations rely on the tacit knowledge and expertise of "exception workers" to make roboprocesses work. Such "exception workers" include the low-level managers called over by a supermarket checkout clerk when an item is returned or misscanned and the clerk lacks the key authority to overrule the cash register; the doctor who knows how to manipulate diagnostic categories to make an insurance company pay for a drug it would usually disallow; or the department administrator who finds a way anthropology professors can pay field assistants in Africa although they do not have the email addresses or tax identification numbers required of "consultants"—the closest classification anyone can find for them in the pull-down menu.

Because roboprocesses deskill workers, confining their work routines to the execution of small components of larger wholes, they often produce a psychology of learned passivity and incuriousness among the mass of employees. An example from my own university illustrates the point. Unable to understand why the computer program Blackboard was not sending messages to my whole class, I called my university's IT department. The person who answered the phone said he was supposed to forward my inquiry to the Blackboard specialist within the IT department and then added that a lot of faculty had been calling with the same question.

"Wouldn't it be more efficient if you knew the answer and just told people?" I ask.

"More efficient? Yes. But I've been told to forward these questions to the Blackboard specialist," he replies.

"Aren't you curious to know the answer, though?"

"I guess so, but I don't have access."

Thus ended our conversation, but it exemplified a broader phenomenon of passivity and credulousness often exhibited by those caught up inside roboprocesses.

Perhaps the most dramatic example of this passivity and credulity is afforded by the strange and increasingly common phenomenon of "death by GPS"—drivers who trust their GPS in situations where common sense should tell them not to. A group of Israeli soldiers, for example, allowed the program Waze to lead them into a no-go zone they were supposed to avoid in the West Bank, where a firefight ensued in which one person died.[39] The writer Greg Milner gives other examples: "the Japanese tourists in Australia who drove their car into the ocean while attempting to reach North Stradbroke Island from the mainland . . . the woman in Bellevue, Washington, who drove her car into a lake that their GPS said was a road . . . the elderly woman in Belgium who tried to use GPS to guide her to her home, 90 miles away, but instead drove hundreds of miles to Zagreb, only realizing her mistake when she noticed the street signs were in Croatian." Milner reports that "the victims often couch their experiences in language that attributes to GPS a peculiar sort of agency. GPS "told us we could drive down there," one of the Japanese tourists explained.[40]

Employee subservience to assigned scripts and routines is often monitored through tape recording of customer service conversations and computer tracking of task efficiency and performance. As Garson says, "the goal of modern management—to dictate exactly how a worker does his job and make him accountable for every minute of the working day . . . can sometimes be defended in terms of efficiency or productivity, but its only consistent objective is control for the sake of control. That's why any large group of workers who can be automated eventually will be."[41]

In recent years perhaps no job has been subjected to more energetic attempts at standardization and deskilling than that of public school teacher, as Anne Lutz Fernandez and Catherine Lutz illustrate in chapter 2 of this book. The U.S. Department of Education, working in concert with the Gates Foundation and the testing industry, has used federal standards and shallowly conceived standardized tests to try to force teachers to surrender their own

initiative and teach classes out of a box. For example, in 2015 the Washington, DC, school system introduced a new automated grading system that removed teachers' discretionary judgment over final grades and made it difficult for them to adjust grades they considered mistaken or unfair. Under the new system, justified by the school system bureaucracy as a way of assuring consistency in grading standards between teachers and schools, teachers input grades for each marking term and for the final exam, and a software program then calculates a final grade, which teachers cannot change by themselves.[42] Teachers complained that this system is, among other things, a recipe for grade inflation, as Emma Brown reports: "The problem, teachers say, is that teachers input letter grades, and the software program assigns those grades the highest numerical value possible. So a student might have earned a 93 percent on a final exam, which is an A, but the computer would interpret that A as a score of 100 percent. Teachers say the issue is most pronounced for students who are doing poorly: A failing grade can range anywhere from a zero to a 63 percent, but the grading program always interprets an 'F' to mean 63 percent."[43]

In the United States, teachers have often been underpaid but still tend to be respected, and they have traditionally been afforded wide discretion in deciding how to approach the challenging task of teaching a classroom full of children with varying ability levels and disciplinary issues. That is changing in our new era of roboprocessed education. In the words of an award-winning public school teacher quoted in the *Washington Post*, "My job is to be debased by an inescapable environment of distrust which insists that teachers cannot be permitted to create and administer their own tests and quizzes, now called 'assessments,' or grade their own students' work appropriately. . . . This counter-intuitive methodology smothers creativity, it restricts students' critical thinking, and assumes a one-size-fits-all attitude. . . . As a profession, we have become increasingly driven by meaningless data points and constant evaluation as opposed to discovery and knowledge."[44]

The second of the six features of roboprocesses is that *these processes of discipline and deskilling are often accompanied by new instances of income extraction and commodification*. Self-service checkout lines at supermarkets and other stores offer a potent example of this feature. Optical scanners had already deskilled checkout clerks, but making these optical scanners self-service has enabled stores to lay off employees and shift their labor to customers. Layoffs of checkout clerks have not been accompanied by lower prices, so store owners captured the savings from redundancies rather than passing them on to consumers, and these consumers now perform for free the labor of the checkout clerks, while being told this is a convenience to them.

If roboprocesses shift some labor costs to consumers, they also turn consumers' online behavior and personal data into commodities that can be mined for profit. Every time we click on something online or buy something with a credit card, we are performing a small act of microlabor that some company somewhere can harvest, commodify, and sell. The activities of such data behemoths as Google and Facebook are well known in this regard. Less well known are a slew of data brokers with such names as ChexSystems, TeleCheck, Alliant Cooperative Data Solutions, Datalogix, Early Warning Systems, and Recorded Future that track everything from bounced checks and gym memberships to utility payments and diet purchases, selling curated lists of consumers.[45] Many of these companies are privately held, their CEOs' salaries hard to ascertain, but we get some indication of the profits to be made from data mining from the CEO salaries we do know: $43.0 million for the CEO of TripAdvisor; $15.7 million for the CEO of Equifax, the company that builds credit scores from individual payment histories (and which incurred a massive data breach in 2017); $10.9 million for the CEO of Alliance Data Systems; and $5.8 million for Mark Zuckerberg, the CEO of Facebook.[46] Datalogix, a company that tracked consumer behavior, was sold to Oracle for $1.2 billion, and Microsoft paid $26 billion to acquire LinkedIn.[47]

Meanwhile, there are fortunes to be made, often at taxpayer expense, writing the elaborate codes that undergird roboprocesses. A single hospital in Chicago spent $5 million hiring coders and retraining doctors so it could comply with new medical reporting standards, for example.[48] But some of the biggest profits are to be made in developing educational tests (which are all but mandated for public schools but largely absent from private schools). When Congress passed the No Child Left Behind Act, it appropriated $400 million for the development and administration of new tests. The value of the school testing market was estimated in 2014 as between $400 and $700 million a year, most of it going to the big four test coding companies: Harcourt Educational Measurement (bought from its parent company for almost $1 billion in 2008); CTB McGraw-Hill; Riverside Publishing; and NCS Pearson. California alone spent $50 million developing new high school tests. Meanwhile, the testing industry has generated, as an expensive side effect, a test preparation industry valued at $13.1 billion in 2015.[49]

Third, and as a corollary to the second point, *roboprocesses have enabled the rise of new, minimally accountable, institutions of wealth and power* that are often unknown to many consumers and citizens. For a fee, these institutions perform audits, do background checks, produce testing material, write computer code, or quietly accumulate information about our consumer transactions, activities on the web, political affiliations, and personal histories. They

often work at the shadowy interface between the private sector and government bureaucracy and in many cases are scarcely regulated or accountable to the public. Meanwhile, they generate considerable wealth for their owners. Such companies include CACI and KeyPoint, which do security clearance investigations; LexisNexis, which does background checks on potential employees for many Fortune 500 companies;[50] Acxiom, which provides detailed consumer profiles to corporate clients;[51] Zoho, whose software provides automated screening of job applicants' résumés; Wonderlic Inc., which writes cognitive and personality tests for human relations departments to use in screening job applicants; the Retail Equation, which monitors how often consumers return purchases for refunds;[52] Palantir, the privately held $9 billion company founded by billionaire Peter Thiel (and partly capitalized at the outset by the CIA), which crunches large data sets to find patterns of terrorist attacks or financial fraud;[53] and Cambridge Analytica, which, until it went out of business in the aftermath of a media exposé, applied proprietary algorithms to Facebook profiles and other social media data and then sold political consultants "psychographic profiles" predicting voting behavior.[54]

One of the best-known examples of an institution that has built wealth and power by acting as a broker of data and algorithms is the credit rating agency Equifax. It employs more than nine thousand people, has information on more than eight hundred million individual consumers, and generates $3.1 billion in annual revenue.[55] Along with its rival credit rating agencies, TransUnion and Experian, Equifax tracks individuals' debt loads, bank balances, and credit card and mortgage payments and uses these data to generate a single number that supposedly captures a person's creditworthiness. Pay your credit card late or miss a mortgage payment and your number will go down, which will make it harder to borrow money in the future and raise the interest rate you have to pay. If you want to get a mortgage or rent an apartment—even in many cases, if you are applying for a job—your Equifax number will help determine your success or failure. The magic numbers churned out by Equifax algorithms wield enormous power over our financial destinies, and yet Equifax and its peers operate with comparatively little government oversight and regulation, though Congress has at least decreed that everyone should have free access to their credit report. For years some consumers complained that their ability to borrow money was damaged by inaccurate Equifax records on their financial histories and that Equifax was often unresponsive to requests that they correct their files. (Fifty-seven thousand formal complaints were lodged with the Consumer Financial Protection Bureau in five years, between 2012 and 2017).[56] In the fall of 2017 it emerged that Equifax had skimped on data security and that the data of about 145 million

people had been hacked from Equifax, including social security numbers, full names, addresses, and other information that was supposed to be private—everything a criminal would need to engage in financial identity theft (and thus damage a person's score on Equifax!).[57] Moreover, this data on citizens' financial histories was collected, commodified, and sold without their consent and, while they paid the price when it was compromised, it was revealed that three senior managers at Equifax saved a considerable portion of their own wealth by selling $1.8 million of their personal Equifax shares before the data breach became public.[58]

One rung below Equifax, Experian, and TransUnion is the so-called fourth bureau. If many of us are now aware of the three big credit reporting bureaus, fourth bureau agencies operate in the shadows, beyond most government regulation. "Almost no one realizes these files exist until something goes wrong," says *Washington Post* reporter Yian Q. Mui, who has investigated the fourth bureau industry. As Mui puts it, fourth bureau companies "target consumers outside the mainstream financial system. Often they are students, immigrants or low-income consumers who do not qualify for traditional loans or choose not to use them. Instead, they rely on a makeshift system of payday lenders, check cashers and prepaid cards." These firms look at magazine subscriptions, day care tuition payments, utility payments, and so on. The information goes into what insiders call the "black box." Then, Mui continues, "out of the black box comes a credit score that can be sold not only to lenders, but also colleges making tuition decisions, landlords choosing tenants or health-care providers determining financial aid." It is hard for consumers to gain access to fourth bureau reports about themselves, and there is no legally mandated process to guarantee them access or to force corrections in inaccurate reports. This can lead to situations like the one experienced by Arkansas resident Catherine Taylor, who, Mui reports, "didn't learn about the fourth bureau until she was denied a job at her local Red Cross several years ago. Her rejection letter came with a copy of her file at a firm called ChoicePoint that detailed criminal charges for the intent to sell and manufacture methamphetamines. The information was incorrect—she says the charges were for another woman with the same name and birth date—but it has haunted her ever since." She subsequently found ten other fourth bureau companies selling the same inaccurate information about her, but she has been unable to force a correction.[59]

Many readers will never have heard of ChoicePoint, but it generated $1 billion in revenue in 2006, when it had one hundred thousand clients, including seven thousand federal, state, and local government agencies. In 2008 it was sold to Reed Elsevier for $3.6 billion, at which point it was rebranded

as LexisNexis Risk Solutions. It was used by the Obama administration to screen potential employees, and it contracted with the state of Florida to purge ineligible voters (who turned out to be mostly Democrats and minorities) from the voter rolls in preparation for the 2000 election, which, turning on the outcome in Florida, gave the White House to George W. Bush.[60]

The fourth feature of roboprocesses is *their often relentless ability to presume and induce standardization and to fail when confronted with the nonstandard*. When I was buying my plane ticket to travel to a conference, my computer dropped its internet connection just as it was processing my credit card information. Had I succeeded in buying the ticket or not? I called American Airlines to find out and heard the recorded instruction, "Press one for a new reservation. Press two to modify an existing reservation." But what if you did not know whether you had a reservation? This is a trivial example, and my problem was easily solved after a few minutes on the phone once I got through to a live person, but this logic of segmentation and standardization is now an all-pervasive feature of the roboprocessed world we inhabit, and systems designers seem driven to create ever-more-elaborate schemas in an obsessive quest for consistency and comprehensiveness. A vivid example of this drift toward greater elaboration is offered by the 2015 introduction of the new ICD-10 classificatory system for diseases and injuries, created by the National Center for Health Statistics to make U.S. practices of medical classification more consistent with those of other countries. The new system increased the number of code categories from fourteen thousand to sixty-eight thousand—at a cost to doctors' offices, hospitals, insurance companies, and government agencies estimated into the billions of dollars. There is now an individual code for "bitten by Macaw" (W61.11), and "crushed by alligator" (W58.03), which is different from the code for "crushed by crocodile" (W58.13), for example. And doctors are required to enter a different code depending on whether a broken finger was on the right or left hand and whether the fracture was in the top, middle, or bottom of the finger.[61] One can see the obvious advantages of the new system for epidemiological studies that may save many lives, but the system was expensive to implement, increases the amount of time doctors spend filling out forms rather than seeing patients, and presents further pretexts for insurance companies to deny reimbursement.

These branching classificatory systems can generate outcomes that violate common sense, producing system malfunction and intense frustration when an algorithm is confronted with what software designers call "edge cases"—unusual or ambiguous cases that fall outside an algorithm's programmed parameters.[62] Examples include airline voice recognition systems that cannot process people with accents; sports tournament registration sites that only

give the option of "father" and "mother" for a student player's parents; optical scanners used to count election votes that exclude ballots if a small piece of the page is torn off;[63] or the Olympic scoreboard designed for three digits because a perfect score was thought impossible, which then gave Romanian gymnast Nadia Comaneci a "1.00" instead of a "10.00" after her performance was judged flawless.[64] More seriously, the U.S. Department of Education website for financial aid applicants did not recognize decimal points, and therefore treated a reported income of $5,000.19 as an income of half a million dollars.[65] Poorly designed classificatory systems offer no easy means of repair for edge cases, and sometimes the algorithms are so rigid and powerful that there is virtually no escape, as in this example shared with me by the employee of a major corporation in the computer industry: her employer installs a program called Wellnomics[66] on employee computers in an effort to reduce workplace injuries, especially carpal-tunnel syndrome. It intermittently requires employees to take a "microbreak" of a few seconds, and twice a day it shuts the computer down for two minutes to force employees to stretch. If you don't take a microbreak when you are told to, then a code red report is sent to your supervisor. The company's concern for employee health is surely commendable, but the system makes no accommodation for people who are in the middle of the perfect sentence or line of code but cannot delay the break. In such situations, as so often with roboprocesses, people have to remake themselves to suit the algorithm, not the other way round.

Thus, fifth, *the assumptions encoded in roboprocesses, when internalized, remake persons and relationships*. Roboprocesses are remaking us as people and reengineering the ways we relate to one another and to institutions. The automated, agentless, godlike quality of some roboprocesses can induce an emotional state of either passivity or rage. (I have seen people, pointlessly but understandably, shout in anger at computerized systems on the phone.) And, in an age of neoliberal striving, the numerical scoring of everything from intelligence to credit histories incites an aggressive statistical curation of the self as people come to internalize algorithmic definitions of success.[67] (We see this result in everything from adults who can tell you their credit scores or the number of Facebook friends or Twitter followers[68] they have to teenagers obsessively counting the number of people who "liked" their latest social media post.[69]) Roboprocesses do not just try to measure and channel behavior; they serve as models for it, and they implicitly communicate what is of value. As the behavioral economist Dan Ariely put it, "CEOs care about stock value because that's how we measure them. If we want to change what they care about, we should change what we measure."[70] If we look at the effects of this dynamic in the world of education, for example, high school

students learn to believe that an SAT score really does measure their intellectual ability (with often terrible consequences for the self-esteem of some smart kids from poorer families), and they learn to equate verbose sentences containing polysyllabic words with good writing because that is rewarded by the SAT's automated scoring of written essays.[71] Meanwhile, higher up education's greasy pole, professors are tempted to believe that the numerical impact factor of the journal in which an article is published matters more than the originality of the article itself and that high scores on student teaching evaluations truly measures one's ability as a teacher.[72]

Some of the most poignant and extreme examples of roboprocesses' ability to remake the self come from the worlds of intimate relationships. Dating sites such as Match.com, OKCupid, or Tinder, which use compatibility calculations of the measured self to suggest romantic or sexual partners, are transforming an area of life that used to be governed by the mysteries of intuition and interpersonal chemistry into an algorithmic science. Meanwhile, "scoring" has taken on a whole new meaning in the dating practices of some young professionals, as an article in the *New York Times* explains. "I take my credit score seriously and so my date can take me seriously," says a twenty-five-year-old woman quoted in the article, which then offers the following explanation from Manisha Thakor, founder and CEO of MoneyZen Wealth Management: "Credit scores are like the dating equivalent of a sexually transmitted disease test. It's a shorthand way to get a sense of someone's financial past the same way an S.T.D. test gives some information about a person's sexual past." One woman profiled in the article recalls being on a first date with a man she really liked until he asked about her credit score: "It was really awkward because he kept telling me that I was the perfect girl for him, but that a low credit score was his deal-breaker." A man in the article worried that his credit score, "marred by a single contested cable bill," was ruining his relationship with his girlfriend.[73] There is even an online dating service called CreditScoreDating. It used to be race, religion, and class that wrecked otherwise promising romantic relationships. Now it's roboprocessed credit scores.

But perhaps the strangest story about the algorithmization of intimate life is one told by the sociologist Arlie Hochschild. She describes a family that uses the parenting evaluation service "Family360" created by a management consulting firm. In Hochschild's telling, the father of this family, who is an executive, convenes a family meeting where he hands out fifty-five-line questionnaires that invite family members to score him, on a scale of one to seven, on such issues as "pays attention to personal feelings when communicating," "says 'I love you' often enough," and solves problems without getting angry or silent." After family members record their scores on three-by-five-inch index

cards, the father "collects everyone's answers and later, privately, calculates his average for all fifty-five items. The family then reconvenes for a group discussion and the father is asked to reflect on his "personal and family inhibitors." Hochschild concludes, "With the help of the consultants, the father than creates an 'Action Plan.'"[74]

If we want to see where such practices may lead us, an experiment in China offers a glimpse of a dystopian future where, with a chilling totality, numerical scores become destiny and social conformism is mediated by algorithms that are both internalized and publicly displayed. In 2010, in Jiangsu Province, the government experimented with a "social credit" system that combined into a single score points for disparate kinds of public and private behavior—a single number to rate and rank the supposed total "trustworthiness" of a person. Some features of this system, such as losing points for running a red light or driving while drunk, are already widely used in Western societies, where they affect insurance rates and eligibility for a driver's license. But the Chinese system combined this scoring of driving infractions with other axes of evaluation. Joining a "cult" or failing to care for elderly relatives: a fifty-point penalty; making a "disturbance" outside government offices: a fifty-point penalty; paying a bribe: a fifty-point penalty; making "false" claims on the internet: a hundred-point penalty. On the other hand, being classified as a "model worker" earned a hundred-point bonus. In the Jiangsu experiment, the resulting scores were used to rank people into four grades, from A to D. People with D grades were not eligible for government support or employment, while the top-ranked scorers were given preference in promotions, getting a job, accessing credit, and other benefits. The Chinese government is now discussing introducing such a scheme on a national scale, with numerical scores determining whether people could fly first class, stay at the nicest hotels, travel abroad, or send their children to the best schools.[75]

Finally, sixth, *this situation produces strategies of agency and action, adaptive to the powerful reality of roboprocesses, that are often dysfunctional*. Faced with the automated immovability of assessment algorithms and bureaucratic roboprocesses, people often make a decision to investigate the architecture of a roboprocess and manipulate it or, out of necessity, to compromise with it in ways that undermine the putative purpose of the system. This is dysfunctional or subversive compliance—the "weapons of the weak" in the era of roboprocesses. Examples include the person who does not cut up the credit card he no longer needs, or go into marriage counseling, because he fears it will reduce his credit score;[76] the job applicant who hires a company to salt her résumé with the keywords favored by résumé screening software; or the university that reduces the permissible time to completion for PhD students,

despite the damage to their careers, so as to look better to *U.S. News and World Report*. A particularly troubling example is the way the Alt-Right created a dense web of citations among its websites to game Google's algorithm, with the result that at one point Google's autocomplete feature prompted searchers with queries that began, "Are Jews . . . ?" and "Are women . . . ?" to end with the word *evil*. Similarly, "Are Muslims . . ." prompted the search suggestion "bad." Clicking on these search terms led to a slew of Alt-Right websites that answered all three queries in the affirmative. Then, in the words of journalist Carole Cadwalladr, "The more people who search for information about Jews, the more people will see links to hate sites, and the more they click on those links (very few people click on to the second page of results) the more traffic the sites will get, the more links they will accrue and the more authoritative they will appear. This is an entirely circular knowledge economy that has only one outcome: an amplification of the message. Jews are evil. Women are evil. Islam must be destroyed."[77] Google intervened once its attention was drawn to the manufactured distortion of these searches, but the protean nature of the internet makes it likely that Google will play "whack a mole" with the Alt-Right (and others) as they find new ways to game Google's system.

Sometimes these strategies stay within the letter of the law while gaming the system, and sometimes they involve outright cheating. There are many examples of gaming the system in the world of higher education. A particularly brazen example is offered by Saudi Arabia's King Abdulaziz University, whose mathematics department, although only two years old, shot to seventh best in the world according to the 2014 *U.S. News and World Report* rankings—ahead of MIT and Cambridge University. The university had offered $72,000 apiece to some of the most cited mathematicians in the world to serve as adjunct faculty, on the condition that they listed their affiliation as King Abdulaziz University with the Thomson Reuters citation website, an important source for *U.S. News and World Report*. They barely spent any time in Saudi Arabia, but their citations had been captured.[78] To climb higher in the *U.S. News and World Report* product rankings, a number of university administrators have invested in strategies that do nothing to improve the education offered by the university but do inflate the metrics that are proxies for presumed quality. These strategies include paying admitted students to retake their SATs in the hope of increasing the average score of an incoming class, while admitting lower-scoring students in January so they do not drag down the September class average, as Baylor University did;[79] encouraging students with no chance of being admitted to apply so as to increase the appearance of selectivity on statistical measures; not making offers to smart students likely to go to other universities so as to increase applicant acceptance ratios;

temporarily hiring one's own unemployed graduates to boost postgraduation employment statistics;[80] and not making offers to students from poor socioeconomic backgrounds who are less likely to complete their degree on time. For-profit university Corinthian College (now bankrupt) maximized its job placement statistics (key to recruiting more students and winning federal support) by placing its graduates in low-quality jobs that churned through them. Former employees said that "their supervisors instructed them to seek out potential employers with typically high turnover rates: That way, as one graduate left or was terminated, a spot opened up for another, enhancing the college's job placement record."[81]

Adjunct faculty, aware that a low average score on teaching evaluations can cost them the renewal of their teaching contract, learn to be particularly skillful in these devious arts. Apart from letting students hand in assignments late and grading generously, so as to maintain their popularity, adjuncts share these tips: hand out evaluation forms when the most hostile student is absent from class or just after a particularly easy assignment; never return an assignment on evaluation day; and squeeze evaluations into the last five minutes of class so students do not have time to overthink them.[82]

And then there is outright cheating as the most brazen strategy for saving one's ranking. Cheating is a form of agency that roboprocesses, through their rigidity, may particularly incite. Tulane University, Emory University, George Washington University, Bucknell College, Iona College, and Claremont McKenna College have all admitted that they submitted incorrect information to *U.S. News and World Report* to increase their rankings.[83] Meanwhile, dogged investigative reporting by the *Washington Post* and the *Atlanta Journal-Constitution* has produced damning evidence of widespread cheating on standardized tests by public-school teachers and often principals. In a situation where low scores can get teachers and principals fired while high scores can bring them financial bonuses and promotions, they took erasers to their students' tests and changed their answers. The *New York Times* quotes one Atlanta teacher, Ms. Parks, as saying "the cheating has been going on so long . . . we considered it part of our job." Her principal supervised test-changing parties, wearing gloves "so as not to leave her fingerprints on the answer sheets." Another Atlanta principal was reported to have guarded the door during "changing parties" where his teachers erased wrong answers. "I need the numbers," he would urge the teachers. "Do what you do." In a jurisdiction where the education superintendent, Beverly Hall, had fired 90 percent of the principals, those who remained were terrified that low numbers would cost them their jobs too. Meanwhile Superintendent Hall earned $500,000 in bonuses for her district's improvement in test scores and was

named superintendent of the year by the American Association of School Administrators. According to the *New York Times*, one underperforming school would have been eligible for $750,000 in federal and state aid had teachers not falsified their students' tests. As one might suspect, it turned out that there was a direct relationship between the $750,000 the school did not get and the $500,000 in bonuses Superintendent Hall did get.[84]

Conclusion

In his book *The Perfect War: Technowar in Vietnam*, James William Gibson argues that U.S. military planners created a "double reality" in Vietnam. On the one hand, there was the actual situation on the ground, where the United States was losing its counterinsurgency campaign. On the other hand, there was the planners' fantasy world of charts and graphs made from inflated body counts produced by officers whose promotions were tied to numerical indices of battlefield productivity. Just like the Vietnam War, the Atlanta school system produced a double reality that allowed local officials to believe the phony numbers manufactured by frontline teachers rather than the evidence all around them of a woefully underperforming school system. Roboprocesses incite the construction of these kinds of double realities when they are rigid, when there is no way to appeal their edicts, when people's jobs and salaries depend on the numbers they spit out, and when the people they evaluate do not recognize, on some fundamental level, their legitimacy. A classic example would be the system introduced by the Veterans Administration (VA) under the Obama administration to reduce wait times at VA hospitals by penalizing doctors and hospitals whose metrics were unsatisfactory. In a situation where a shortage of doctors and a flood of new patients from the wars in Iraq and Afghanistan made a reduction in wait times without a massive infusion of extra resources a bizarre fantasy only politicians and out-of-touch bureaucrats could embrace with a straight face, doctors and hospital administrators gamed the record-keeping system and falsified data. They logged the first date available for an appointment as the date the patient requested, so that a requirement that patients wait no longer than fourteen days for an appointment could be met; they denied patients follow-up visits; they created nonexistent "ghost clinics" so it looked as if veterans were receiving primary care; and they falsified patient records.[85] This was a classic double reality: the numbers looked good to bureaucrats in Washington, but the patients were getting lousy health care.

The VA and Atlanta school system examples are extreme, but in some more modest sense, it is the essence of roboprocesses that they produce such

double realities. They invite daters to substitute a credit score for their own intuitive response to the embodied suitor before them; they incite parents to judge teachers by numerical algorithms rather than by the stories their children bring home; they prompt doctors to peer at the computer diagnosis rather than the patient just behind the computer; and they bait investors into putting their money in Lehman Brothers rather than asking whether they should invest large sums of money based on assurances about something they did not understand called "credit default swaps."

One strategy of resistance to roboprocesses is to always point out the ways in which the algorithms that underlie them stand askew from the real world. It is time to bring roboprocesses into analytic focus so that we can understand their relationship to neoliberal forms of discipline and the mechanisms through which these forms of discipline work to such deformative effect. A clearer understanding of roboprocesses will enable us to see the ways things are going wrong in finance, medicine, education, housing, the workplace, and the battlefield not as separate problems but as linked manifestations of a deeper defect in fundamental ordering processes in our society. Only then will we be equipped to push back the tide of algorithms and work toward a more humane society.

Categories

1

Automated Expulsion in the U.S. Foreclosure Epidemic

NOELLE STOUT

More than fourteen million Americans have lost their homes to foreclosure since the subprime mortgage crash of 2007, the highest rate of bank seizures in national history. Just one year into the crash, one in every 520 homes in the United States was in foreclosure. These rates were doubled in high-growth states such as Arizona, California, and Florida, where entire residential streets suddenly stood vacant. Major cities, once thriving, were forced into bankruptcy. Homelessness surged, and tent cities grew overnight. In analyzing the devastating consequences of the mortgage debacle, scholars and journalists have fingered the failures of greedy financiers, incompetent financial institutions, government agencies, and American homeowners living beyond their means. This emphasis, however, occludes an analysis of the everyday mechanics that triggered unprecedented dispossessions—in particular, how the rise of algorithmic and automated processes has shaped contemporary dispossessions.

In the wake of the crash, a dynamic interplay between automation and expulsion has emerged as calculative systems were imbued with the illusory authority of objectivity, displacing human actors and defying common sense. In this chapter, I show how the automated processes exemplified by the governmental–private-sector loan modification bureaucracies established in 2009 and the robosigning scandal emerging in 2010 systematized and standardized the foreclosure process. New systems designed to maximize efficiency and thus profits for investors often introduced rampant errors, prevented humane decision making, and punished those homeowners who most qualified for mortgage assistance. To illustrate how automated processes have led to unparalleled numbers of bank seizures of American homes—in the millions—I draw on long-term research beginning in 2012 among homeowners

applying for loan modifications and the lending employees processing their appeals in California's Sacramento Valley, one of the hardest-hit regions in the nation.

Here I focus on the automated systems that have enabled millions of foreclosures, but it is important to recognize how similar algorithmic processes played a significant role in the expansion of high-risk subprime lending and the Wall Street financialization of U.S. mortgage markets that led to the 2007 mortgage crash. Wall Street investment firms used technological innovations to relax underwriting standards that determined a mortgagor's qualifications. Within months after a new homeowner signed a subprime mortgage contract, mortgage loans were bundled into collateralized debt obligations and sold as securities in a secondary derivatives market, which relies on algorithmic technologies to trade in contracts, such as futures and options, based on other assets. The pools of mortgages would be divided into tranches, often organized around their risk level. Through this reselling, high-risk subprime loans were mislabeled as safe investments and enmeshed in high-value stocks in retirement and other investment funds. At each step in the process, investors and loan officers depended on algorithms and automated systems to transform mortgagors and their long-term debts into abstract payment streams.[1]

In a system where incentives depended on commissions and transactions, lenders and mortgage brokers could take advantage of so-called creative mortgage products—technologically driven formulas that produced mortgage loans—while deferring the decision making, and the responsibility, to automated systems. Pressured to keep up with Wall Street's demand for mortgage loans to feed secondary markets, many brokers and lending employees pushed high-risk, high-interest loans on mortgagors who would ordinarily not qualify for them. Underwriting algorithms allowed borrowers to qualify against their best interests, such as elderly couples living on fixed incomes who were convinced to take a second mortgage on a home that was already paid off. Other homebuyers who qualified for conservative, fixed-rate mortgages with lower interest rates were duped into taking high-risk loans with introductory teaser rates that would balloon within a matter of years because commissions were higher for these subprime products. Meanwhile, mortgage brokers and lenders exposed themselves to little risk: within months the mortgage loan would be securitized and sold on a booming derivatives market. What's more, when the scheme collapsed, Wall Street investors correctly surmised that a government bailout would rescue them.[2]

Whereas before the 2007 collapse, automated underwriting standards were relaxed to saddle homeowners with loans they could not afford, after the

crash, different algorithmic formulas forced millions of homeowners seeking to modify their loans to default. At first glance, these foreclosures might seem straightforward: a homeowner falls behind on mortgage payments and a lender seizes the home, which served as collateral for the loan. But in the aftermath of the crash, lenders and loan servicers employed algorithms to determine whether to proceed with evictions and relied on automated protocols to carry out bank seizures that are anything but commonsensical. According to many bank employees adjudicating these processes, before the use of these automated systems, employees had more leeway to decide the worthiness of homeowners seeking assistance. Lauded for their ability to limit human error and increase efficiency, these automated practices have triggered the dispossession of millions of Americans, embroiling mortgagors in byzantine dramas leading to illogical outcomes and ethically suspect home seizures.

The Maze of Loan Modification

With plans to expand their family, Susan and Rick Condit, a white married couple in their late twenties, purchased a modest three-bedroom home in a lower-middle-class Sacramento suburb for $250,000 in 2006, at the height of the market.[3] Their monthly mortgage was a stretch, but they cut back on expenses to cover their payments. By 2009, as mortgage markets collapsed, their home was worth less than half of the amount they paid, with no hope of recovering its value. Due to severe California state cutbacks during the Great Recession, Susan lost her job as a first-grade teacher in the public schools. Rick, who had made a decent living installing air-conditioning units in new houses during the construction boom, found work drying up as the mortgage crash took its toll on housing stock in the region. Shortly thereafter, Susan gave birth to their second daughter, who was diagnosed with a severe cleft palate. No longer able to rely on Susan's health insurance, they amassed hefty insurance bills to cover their daughter's corrective surgeries.

Faced with an impossible mortgage payment, Susan learned about government-sponsored homeowner assistance programs through television and billboard ads that had become ubiquitous in Sacramento following the crash. Between 2007 and 2008, mortgage defaults in Sacramento had increased sixfold, with foreclosures jumping 482 percent. By 2008, one in every 67 households had filed for foreclosure. For the next five years, California's capital city would consistently rank in the top ten in foreclosures per capita in U.S. metro areas.[4] The ads targeting the many Sacramento homeowners losing their homes showed mortgagors calling their lenders and loan servicers, the financial institutions managing mortgages, and receiving swift

assistance.[5] After reading the checklist online, Susan decided that she and Rick were ideal candidates for the Home Affordable Modification Program (HAMP) administered by private lenders. As the advertisements suggested, Susan and Rick were "hardworking Americans struggling with a health crisis and sudden unemployment" who had never missed a mortgage payment—the precise candidates HAMP was designed to serve.

HAMP was part of the economic recovery legislation proposed by the Obama administration, in which banks requesting bailout funds received financial incentives to modify homeowners' underwater mortgages. A temporary salve to address the subprime crash, the programs were set to expire in 2016 and encouraged lenders to calculate whether they would save money by modifying qualifying mortgages and, if so, to halt foreclosures. The Treasury Department asked, though did not mandate, lenders administering HAMP programs to adjust homeowners' monthly loan payments to no more than 31 percent of their income. If by accepting reduced payments lenders would collect more money over the life of the loan, lenders were required to approve the modifications under Treasury guidelines.

Susan spent hours on the phone with various service representatives at Goliath Bank, her mortgagor administering HAMP, trying to decipher the cryptic application instructions on the website. Each time she called she was asked for the same information regarding her case. Eventually, she compiled the necessary application materials and carted her daughters to a copy center to fax the paperwork, which included a letter detailing her qualifying hardship, which in her case was loss of income; a detailed expense sheet with the family's monthly expenses, including car loans, credit card debt, gas, water, internet, groceries, and school expenses; a tax authorization form; recent pay stubs that showed year-to-date earnings; a statement of unemployment benefits; the last twelve months of bank statements, noting large deposits and where they came from; and federal tax returns. On the cover sheet, Susan was instructed to include the number associated with her mortgage. She waited a week to follow up and called to confirm that the paperwork had been received. The friendly customer service representative said it was too soon to confirm either way and to call back in a couple of weeks.

A month after she had submitted the paperwork, Susan still had heard nothing and called again. A sympathetic employee told her there was no record of her application. She should fax the paperwork again. "My name is Ladonna," the representative said, "This time, call back right away and ask for me to make sure we got it." Back to the copy center Susan headed. She called the Goliath Bank number after the fax went through and asked to speak to Ladonna. "That won't be possible," the man on the line told her, "but I'll be

happy to help you. First, I'll need some basic information about your case to find out if you're eligible for assistance." Susan hung up the phone. She waited three days and called again. "Yes, we've received your paperwork. Everything is in order," a chipper representative reported. "We will be in touch shortly with a decision."

Susan felt immediate relief. She allowed herself to focus on her daughter's upcoming surgery and recovery, putting the thought of losing their home in the back of her mind. After a couple of months she called to check on her application. The service representative explained that in order to qualify, she had to be at least three months behind on her payments. Once she had missed three mortgage payments, she should resubmit the paperwork to begin the application process. "Why hadn't anyone mentioned that to me before?" Susan yelled into the phone, to which the representative responded, "My apologies, ma'am. Is there anything else I can do for you today?"

Despite their frustration with the process, Susan and Rick were relieved to stop paying their mortgage. They could put mortgage payments toward medical expenses. After three months, Susan called Goliath Bank before sending the paperwork. Since her mortgage was now delinquent, they transferred her to collections. After taking her information, the person on the phone began advising her on how she might find a way to make the payments. She insisted that she was interested in and qualified for a loan modification. The representative put her on hold to transfer her to an account specialist. After seventeen minutes of listening to music and advertisements for Goliath Bank services, the line dropped. She would have to start again. This time, she called the toll-free number and insisted on talking to someone in the loan modification department rather than collections. "Please give me your mortgage number so we can verify that that would be the best way to assist you," the representative repeated. "If you're delinquent, you have to go through collections."

Susan's application would eventually reach the loan modification office of Goliath Bank. But since thirty days had passed trying to get the paperwork recognized, her application was now considered outdated, or "stale," in the lingo of mortgage modification specialists. The representative explained that she and her husband could have started working in the past thirty days or had come into money that wouldn't be reflected on her previous bank statements. She would have to update the forms and resubmit them by fax. "I'd be happy to provide you with that fax number," the representative chirped. Susan hung up the phone.

Susan and Rick were eventually approved to begin a trial loan modification; they would pay a reduced amount with a guarantee that after three months their application would receive a final decision. Seven months into

the trial plan, Susan and Rick were denied. The service representative explained that the investors who actually owned the mortgage refused to sign off on the modification. In this case, Goliath Bank was simply servicing the loan but did not have the authority to approve the modification. They had thirty days to pay the missing balance on the past seven months of modified payments, in addition to the three months in arrears. Outraged, Susan and Rick decided to stay in their home without paying until they were evicted in 2011.

Since HAMP was established in 2009, private lenders administering the federal program have rejected 4 million of the 5.7 million homeowners who have requested modifications.[6] The frustrating experience of being caught in a roboprocess that Susan Condit experienced in attempting to stave off foreclosure was universal among homeowners embroiled in modifications whom I interviewed. In a 2011 study of California housing counselors, 94 percent reported that homeowners were losing their homes while negotiating for a loan modification with their servicers.[7] One white working-class freelance journalist in her thirties never missed a payment but was foreclosed on by JPMorgan Chase while paying into a trial modification program.[8] A seventy-year-old Latino veteran who applied for a modification after losing his wife to cancer faxed his loan modification paperwork four times, only to have Goliath Bank deny the application because he had failed to provide his wife's signature. A forty-year-old white preschool teacher was instructed that she couldn't qualify for a modification until she was behind on her payments, and then she was sent to collections, where Golden Gate Mortgaging refused to offer her a modification because she was too far in arrears. A sixty-six-year-old African American medical technician caring for her ailing mother was denied a loan modification because TrustWorth Financial continuously overestimated her fixed Social Security income.

In a stark departure from previous government actions that addressed the foreclosure crisis of the Great Depression, government assistance programs established in the aftermath of the 2007 crash left loan restructuring in the hands of the very mortgage industry giants that had destabilized mortgage markets in the first place. Whereas in the 1930s the government had bought homeowners' toxic mortgages and leniently cooperated with them to help them pay off their debts, recent corporate modification bureaucracies behave in ways dictated by the profit motives of private lenders. Given the high rate of denial, the rise of publicly funded private-sector loan modification bureaucracies did little more than create new algorithmic processes that worked against homeowners attempting to stay current on their mortgages. Writing

about similar housing assistance programs for residents of New Orleans after Hurricane Katrina, Vincanne Adams describes privately organized, publicly funded bureaucratic failures as "the inefficiencies of profit." Adams acknowledges that subcontracting government work to the private sector is not new but criticizes how for-profit businesses have "come to be involved in public-sector activities in largely unregulated ways."[9]

Misplaced documents, errors, and misinformation led many Sacramento homeowners to lose faith in lending institutions and financial processes that they had once assumed were fair. In response, some homeowners, including Susan and Rick Condit, squatted in their homes without payment for months at a time, waiting for evictions. Others moved what money they had left to local credit unions that were uninvolved in the lending crisis, and still others pledged never to purchase a home again. These actions, while perhaps minor in their own right, reflect a collective belief that entanglements in roboprocesses inspire mortgagors to repudiate the social contracts implicit in contemporary American debt obligations. Few homeowners I interviewed advocated radical stances toward debt; in fact, most had never missed a credit card payment. These homeowners facing foreclosure in lower-middle- and middle-class neighborhoods often explained that they had once labeled people who failed to repay their debts as "deadbeats," but their views had changed during the protracted experience of being caught in the automated maze of loan modification appeals.

Massive waves of expulsion arising from modification denials indicate significant flaws in automated processes in which lending employees collect borrower information and enter that data into computer programs to determine outcomes. Studies of actual loan modification outcomes describe nationwide problems: loan servicers regularly lose homeowners' documents, miscalculate mortgagors' incomes in ways that disqualify them, make numerous errors, foreclose prematurely, and keep homeowners making trial payments for months or longer, only to deny their applications.[10] Homeowners spending hours a week to modify their loans, trying to make payments on underwater mortgages, are caught in an appeals process riddled with conflicting information and irrational outcomes. The process erodes mortgagors' trust in banks and financial institutions, as they lose any remaining loyalty toward creditors. These sentiments are exacerbated by a growing public knowledge of the illegal practices of lending institutions pushing through suspect foreclosures. Many homeowners ask why they should shoulder the burden of diminishing returns when lenders ignore foreclosure laws, accept taxpayer bailouts, and refuse to offer government-mandated assistance.

Robosigning

As U.S. foreclosures reached epic numbers in 2010, journalists began to report that illegal practices were fueling the epidemic. Nearly half of all states, including California, require judicial foreclosure, in which lenders must submit an affidavit signed under oath that a bank employee has reviewed the necessary documents. To safeguard against unlawful seizures, these documents and their accompanying signatures are intended to prove that a mortgagor has defaulted on a loan and that the lender holds the mortgage before a foreclosure can proceed. But when homeowners began to challenge the affidavits, the courts found that the employees whose signatures authorized bank seizures often signed without ever reviewing the documents.

Employees for mortgage giants including Bank of America, JPMorgan Chase, Wells Fargo, and GMAC have all testified that they signed thousands of affidavits a month, spending only seconds on each. These employees described how their signatures morphed into unrecognizable symbols as they hastily sped through documents, and many remained oblivious to the meaning of the papers they were signing. One lending employee, Jeffrey Stephan, for example, testified that he signed off on ten thousand foreclosure documents per month for five years for GMAC.[11] Dubbed "robosigners" by the press for the ways in which these human employees were transformed into robotic actors, the men and women were often temporary employees who knew little about the legal processes entailed in foreclosures. Financial institutions, according to a Florida lawsuit, hired employees with no background or training, including hairstylists, Walmart retail employees, and assembly line workers, to sign foreclosure papers.[12] At JPMorgan, robosigners were called the "Burger King kids" to signal how they had been hired off the street and had little knowledge of mortgaging.[13] A foreclosure supervisor charged with signing foreclosure documents for Litton Loan could not describe the required conditions for a bank to foreclose and, when pressed, failed to define such basic terms as *promissory note*, *mortgagee*, or *lien*.[14] Tam Doan, a former employee in Bank of America's Southern California foreclosure department, reflected on the likelihood that each of his signatures led to a borrower losing his or her home and said, "I shudder to think how many foreclosure documents have my name on it [*sic*]."[15]

In the wake of the foreclosure epidemic, robosigning became a metaphor for the evacuation of human agency that transformed human employees into automatons. Meant to provide a rational, human safeguard against wrongful seizures, employees instead became unquestioning robots whose primary role was to set aside any hint of discernment or judgment. The deskilling of

labor within the robosigning scandal reflects a fundamental aspect of roboprocessing as detailed by many chapters in this volume. Banks turned to robosigners because it was more cost-effective to hire untrained workers to process millions of foreclosure cases and, after facing widespread criticism, lending executives at Bank of America and elsewhere defended the practice by deflecting attention to the homeowners who were in arrears. The process could be automated, according to executives defending the banks, because the review and signing of documents was a mere technicality in a process that would inevitably lead to foreclosure. While true that most homeowners facing foreclosures due to fraudulently signed documents were behind on payments, the automation of foreclosures removed the human decision-making elements that were meant to safeguard wrongful seizures.

Robosigners, for example, often ignored lenders' inability to produce mortgage notes. The chain of ownership had become so convoluted through the process of securitization—in which a loan that originated, for example, with Countrywide was sold to JPMorgan and then to Litton Loan—that the documentation proving Litton owned the loan could not be produced. In fact, banks failed to prove ownership of the underlying mortgage in 30 percent of bankruptcy cases.[16] Law firms around the United States repurposed themselves as third-party companies that could fabricate the necessary paperwork and affidavits to push through foreclosures. Coined "foreclosure mills" in the popular press, these firms were similarly accused of employing robosigning practices and taking shortcuts—pushing through foreclosures and completing the mandatory paperwork after evictions had already occurred, then backdating the necessary documents.

The robosigning scandal forced major lenders to temporarily halt foreclosures and inspired a governmental review of 4.5 million home loans.[17] In 2012, the review resulted in a fifty-billion-dollar settlement among forty-nine state attorneys general and five major banks. From this largest consumer financial protection settlement in U.S. history, settlement funds were provisioned to help homeowners in need of modifications, to offer payments to borrowers who lost their homes to foreclosure, and to dole out payments to state governments.[18] The National Mortgage Settlement administrator mailed notices to eligible borrowers informing them that they would receive a small monetary sum as part of the settlement, but many never came forward to submit claims. An insider in the Mortgage Settlement process told me that the mailer looked like a number of junk mailings offering "free cash," and most homeowners, weary of foreclosure-related ads and schemes, would simply throw it away. In any event, for many of the homeowners with whom I spoke, a small check seemed like an insult after losing their homes.

Profit-Driven Outcomes

Dispossessed homeowners in the Sacramento Valley tend to argue that the massive waves of foreclosure that vacated their neighborhoods were purposefully orchestrated by lenders and loan servicers undertaking a massive land grab. In contrast, former lending employees who worked in institutions pushing through foreclosures often describe a lack of investment in resources and infrastructure to service the enormous number of delinquent loans after the crash that fueled the epidemic. For example, many of my respondents who had worked in one loan modification center highlighted the reliance on a temporary workforce and the antiquated computer systems that contributed to the denials they witnessed. David Silva, a white midlevel modification specialist at Goliath Bank in his early thirties, described the impenetrability of the computer system that managed homeowners' case files. He complained that he was unable to access records of previous decisions made by other departments. When he told a homeowner that a file was incomplete, it reflected more what he saw on the screen than what was actually in a file. Given high rates of turnover in his department and the mandatory weekly shuffling of cases to different service representatives, actions already taken on a case were hidden from the new, temporary case manager. Files of paperwork were compiled in another department, where temporary staffers collated application documents and marked off a checklist to show what paperwork was still missing. At the loan servicer Ocwen, employees described similar problems as they struggled to manage more than 8,400 computer codes to categorize issues within a borrower's file, with many confusing duplicates.[19]

Other lending employees tasked with processing loan modification applications pointed to massive disorganization. Rhonda James, a fifty-year-old African American woman who had worked for a mortgage lender before the crash and now directed a government-funded housing counseling agency, explained that HAMP originally had one fax number that went to whatever line was open first. According to James, a homeowner in California would fax paperwork that could easily end up in the Washington, DC, office if that line was free. Banking employees processing loan modifications described similar disorder, explaining that the lenders and loan servicers for whom they worked were unprepared for the onslaught of calls and applications they received. One center might field more than fifty thousand calls a day from distressed homeowners. Guidelines changed frequently, as did the laws determining how foreclosure proceedings should be handled. Wanda Chavez, a Latina loan modification specialist in her midforties, recalled being called into her manager's office with a group of coworkers and instructed to "push

applications down the waterfall," the industry term for moving applicants toward foreclosure. The following week, Chavez and her coworkers were corralled again and told that the guidelines determining modification eligibility had changed, and now they were instructed to halt denials. "I realized that the denials we had pushed through just the week before were probably illegal," Chavez told me. "Even worse, who made that cutoff was totally arbitrary. There was no sense to it."

In a civil lawsuit filed in Massachusetts against Bank of America, the actions of the bank appear more directly orchestrated. The suit presents sworn statements from employees in the mortgaging servicing unit who claim that they were instructed to lie to homeowners, encouraged to meet foreclosure quotas, and rewarded with bonuses for pushing people into foreclosure. The former employees recounted being instructed to mislead borrowers by telling them that documents were incomplete and by purposefully holding financial documents for thirty days, at which point homeowners would have to reapply with updated information.[20]

Automated processes driving the U.S. foreclosure epidemic were not free-floating algorithms causing chaos; they were programmed to make specific, calculated decisions. Corporate lenders' failure to invest in the proper infrastructure to ensure timely review of applications was driven by profit. Contrary to homeowners' assumptions, modifications did not depend on how "upstanding" a borrower might be, nor were the programs crafted to right the wrongs of subprime lending. Government-sponsored modification programs such as HAMP required lenders and loan servicers to calculate whether they would profit *more* from receiving modified payments than they would from pursuing foreclosure and, if so, to halt foreclosure proceedings. The widespread advertisements for mortgage assistance used terms such as *help*, *qualified borrowers*, and *assistance*, when in fact foreclosure decisions were made in the service of the profits of lenders. Many homeowners in the Sacramento Valley assumed that compiling the right paperwork, contacting the right customer service representative, or presenting a more convincing case could save their homes, when in fact the algorithms determining their fate and the employees charged with pushing through these automated processes were programmed to work against homeowners' interests.

Unintended Consequences

Automated processes employing algorithmic calculations have induced unparalleled foreclosures, but industry officials point to the increased efficiency that these systems provide. Human underwriting can take up to sixty days,

whereas underwriting software can make decisions in minutes. Perhaps unsurprisingly, the prevalence of hybrid human-computer procedures has allowed private mortgage lenders and loan services to claim that clerical or computer errors are behind wrongful foreclosures, thereby absolving managers and upper-level employees of personal responsibility for the devastating outcomes of the crash. As one former manager at Goldman Sachs described the robosigning scandal, "Don't you think, out of 10 million data points, there will be 500 unbelievably screwy examples? I don't get it. It doesn't feel like this is fraud. Maybe there is sloppiness, but at the end of the day, people took out mortgages they can't pay back. Now I worry that if anything, the government is making something that is just a clerical error into something that would be nefarious."[21]

Obviously, to describe widespread fraud as a series of innocent clerical errors mischaracterizes the debacle, but the manager's comments highlight the many questions that remain regarding the nefarious nature of these automated systems. Financial standardization and automation, often legitimated by an illusion of objectivity, have come to cover for corruption, manipulation, and fraud—but were they designed to do so? Not necessarily. Lending executives and Wall Street investors did not conspire to surrender decision making to algorithmic processes in order to orchestrate a massive transfer of wealth from lower-class and middle-class homeowners to financial institutions. As many bank executives have told me, the management of foreclosed properties presents an unexpected burden that banks are unprepared to handle. Instead, the catastrophic results of bank foreclosures indicate the dangers of crafting algorithms to maximize profits, relying on automated processes while understaffing workforces to implement them. Robosigning saved lenders millions of dollars in staff hours, just as loan modification algorithms allowed lending employees with minimal training to process thousands of applications daily. Rather than a plot on the part of lending institutions to colonize entire neighborhoods, heterogeneous and seemingly rational procedures developed to maximize profits through efficiency led to disastrous outcomes. In fact, in the case of HAMP loan modifications, the creation of automated systems was inspired by reformist intentions as government agencies sought to streamline assistance to millions of borrowers who struggled to make mortgage payments.[22] Yet because these systems were relegated to the private sector and ultimately designed to maximize revenues for private lenders, they fostered expulsions. Computerized technologies donned an aura of absolute authority that displaced human actors and logical decision making.

Yet ultimately, the nonsensical realities generated by automation have significantly undermined the legitimacy of major financial institutions as homeowners

have come to question the millions of bank seizures that have occurred since 2007. Homeowners' feelings of loss and shame, which historically accompanied evictions for lower-middle-class and middle-class families, are now overwhelmed by the frustration of confronting Kafkaesque automated systems in place of human lenders. In the end, the motivations behind automation are irrelevant: both in leading up to the mortgage crash and its aftermath, calculative financial systems rationalized long-standing inequities through a process of converting people into data points.[23]

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Roboeducation

ANNE LUTZ FERNANDEZ AND CATHERINE LUTZ

In 2011, Carolyn Abbott received the startling news that she was the worst eighth grade math teacher in New York City. The "Teacher Data Report" prepared by the city's Department of Education ranked Carolyn, working at a Manhattan public middle school, dead last: no other teachers of the subject and grade scored below her.

The report compares standardized test scores from one year to the next and uses *value-added modeling* (VAM), a statistical method that assumes students who do better or worse than expected from one year to the next do so as a result of the quality of their teacher. That the report is intended to motivate teachers through praise and shame was driven home by its publication in the local media, including the *New York Times*. Carolyn's principal, who was happy with her teaching, explained that nonetheless the score could affect her ability to get tenure.[1]

Carolyn achieved her distinction not because she was terrible at teaching math but because her students were terrific at learning it. Her gifted and wealthy students' test scores the previous year left little room for improvement, and so by the light of the algorithm of the city's education bureaucracy, she was adding no value. This is especially ironic given she had taught the same group of students in seventh grade, when they had set the bar so high.

Carolyn Abbott is but one data point within the vast and increasingly automated enterprise of developing and evaluating teachers, and the report that shamed her is but one of many bureaucratic processes in contemporary American K-12 education that have the putative goal of improving teaching and learning but are instead warping it. These robotic processes frequently produce surreal outcomes, resulting from the implementation of statistical thinking at once crude and convoluted, a shift to automated sorting of the

millions of U.S. students and teachers, and mistaken understandings of what makes for good teaching.

They include a massive testing regime for evaluating students; a proliferation of teacher assessment systems; and the rollout of standardized, even scripted curricula. Over the course of two years, we traveled the country to meet teachers and visit schools across a range of settings to hear how educators understand and experience this transformation. Inside educational institutions, teachers see the art and love of learning and teaching being inserted into an automated machine and a series of counterproductive, demoralizing effects spitting out the other end.

Testing, Sorting, and Boxing American Children and Teachers

Students in U.S. public schools take an absurd number of standardized tests—as many as 20 in a single year and an estimated 113 over the course of their K-12 careers (in addition to the other nonstandardized tests meant to let their teachers assess their progress).[2] These tests are administered under a variety of federal, state, and district mandates, for a panoply of reasons, including "state and federal accountability, grade promotions, English proficiency, program evaluation, teacher evaluation, diagnostics, end-of-year predictions, fulfilling the requirements of specific grants,"[3] many but not all of which have to do with the sorting of students into various boxes.

Educational bureaucracy in the United States has been sorting students for a long time. Standardized testing began early in the twentieth century, though in a limited way; it was then meant to improve efficiency and to manage the massive growth in the number of public-school students.[4] The IQ test, originally used to sort enlisted men into army jobs in the World War I era, found new use in the schoolroom to help slot students into vocational or college tracks. But with the invention of an automated scanner in 1936—the IBM 805—testing really took off as results could now be rapidly evaluated. Schools began to use standardized testing to determine who would graduate and who would go to which college as the SAT and American College Test (ACT) sorted students for college admissions.

Fast-forward to today. It's difficult to say how many hours and days that American children spend sitting for standardized tests, though some estimates suggest it may represent only a small portion of the school year.[5] Official testing time, however, is dwarfed by the total person-hours spent by education boards, state officials, district and school administrators, and teachers preparing to administer these tests, administering them, and evaluating

their results. The children in turn spend untold hours being prepped for these tests, diverting classroom and homework time from more meaningful instruction and exploration.

And while the stated purpose of many of the tests is to evaluate what students know and can do, their form dictates a narrow kind of education. Most standardized tests are multiple-choice fill-in-the-bubble tests, encouraging rote memorization and practice with test-taking strategies. As teacher Robert Lewis said to us, "It's not teaching kids how to think. You're teaching them things that you want them to know . . . that's a disservice." Although some standardized tests include so-called performance tasks that require critical thinking, reading, or writing, such as responding to a prompt by drafting an essay, even some of these responses are now graded not by humans but by computers.

Some of the newest tests—the Smarter Balanced Assessment Consortium (SBAC) and Partnership for Assessment of Readiness for College and Careers (PARCC) tests—are meant to align with the controversial Common Core State Standards (CCSS). The Common Core is the outcome of an initiative, begun in the mid-1990s, of state governors and corporate executives to improve "standards and accountability" in education by promoting national standards for what skills and knowledge all students should have achieved in math and English by the end of each grade level. The tests on these standards are touted as having the advantage of requiring students to show their work or demonstrate various ways of getting to an answer, yet they remain highly reductive, focusing on a handful of skills evaluated in a handful of ways. Most items on the SBAC test are, as the consortium puts it, "engine"-graded, and it appears to be shifting the rest, including many of the essays, to computer rather than human raters.[6] The explosion of these tests, the rising numbers of students taking them, and the desire to control the costs of human graders will lead to machines taking over even essay grading.[7] This shift is problematic given that machine scoring relies on what can be readily quantified, and thus data points on the complexity of vocabulary, use of grammar, and length of sentences and paragraphs are used as a proxy for the depth of thinking and quality of its expression. Elegant pablum, even nonsense, can fool the machine. Essays are the singular element of most standardized tests that allow students to demonstrate their creativity, critical thinking, and values; computer scoring reduces the art of writing to the task of a technician. At the heart, as the National Council of Teachers of English explained, "Computer scoring removes the purpose from written communication—to create human interactions through a complex, socially consequential system of meaning making."[8]

The Downsides of an Uptick in Test Taking

When children take so many tests, tests in which so many individuals and institutions have vested interests, they cease being students. They become instead little test-taking machines, in service to various, at times conflicting, agendas. In this swirl of education data, the children are the data producers, whose job it is to make the numbers. And their unpaid work, upon which so many paid adult jobs depend, can become terribly stressful. Research has shown that test-taking anxiety, long an issue for a subset of students and by some measures a significant issue for African American children, has been sharply intensified by today's high-stakes testing.[9] Test anxiety not only harms the children, it impairs their performance on the tests themselves.

And yet largely, these child workers comply. When we visited one urban middle school, dozens of students were assembled in the library to take a computer-based social studies test. Tech staff were on hand, along with teachers and administrators, who stressed that, although it was a pilot, and the test takers would be helping the state and test maker Pearson work out any bugs in the software, the test had direct implications for those workers poised at laptops. "We're testing the system, but the test itself is tied to you: It counts," one administrator ominously warned. A student's grumble about having to take so many tests was swiftly quelled, and when another nervously asked how the scores would be used, he was told that his "data," which would be placed in his file, would affect his ability to go on to high school and color his entire experience there: "That's how classes will be determined, whether you go to the next grade level, whether you graduate, so don't think it doesn't matter." At the words, "Ready? Begin," the hall of middle schoolers were ready and they began.

Test-prep boredom and test-taking anxiety are not the only reasons American children are spending less time on and getting less pleasure from reading and hands-on learning. Standardized testing is reshaping their school days in more profound ways: many schools have narrowed the curriculum to focus on the tested subjects.

Sometimes, this narrowing is explicit: in the middle school where we watched students take that pilot test, a schedule had been instituted the previous year to build in more minutes for math and English at the expense of art, music, and physical education. Sometimes, this narrowing is illicit. One Dallas elementary school plumped up test scores by devoting much of the year exclusively to math and reading; the principal told teachers to falsify students' grades for science, social studies, and other subjects that were not taught because they were not going to be tested.[10] Across the country, physical

education and recess time have been cut to provide more time for math and reading.[11] This, despite all that we know about how physical activity for children contributes to lower obesity rates and healthier adulthoods, not to mention stronger learning contexts (including better concentration, memory, and behavior) and higher overall achievement levels. Medical recommendations are that elementary students have at least 150 minutes per week of physical education, but less than a fifth of public school third graders had that much in a recent school year.[12]

Students and teachers in the tested grades have it the worst. When we met her, Saint Paul teacher Ulla Tervo-Desnick was persisting in taking her students out for recess multiple times a day—something she knows, having been trained in her native Finland, to be highly beneficial to children's social, emotional, physical, and cognitive development. She can only "get away" with it, however, because she teaches first grade; Minnesota state testing begins in third grade. She told us, "I would move to higher grades, but for me [this grade] still gives me a little bit of freedom to do the things that I see are right for kids." Ulla is fortunate that her principal allows her to keep that freedom. Across the country, teachers like her, the most talented teachers in their districts, are being reassigned to teach the grades in which high-stakes testing takes place.[13] Other dysfunctional school-level responses to testing that have been documented by scholars evaluating its effects include suspending low-scoring students for the testing period or labeling them as learning-disabled; focusing attention unduly on students just below the "proficiency" cutoff; or even, in isolated cases, changing students' test answers.[14]

Most disturbing of all is the evidence that this testing regime has resulted in little good. National test scores rose only modestly between 2003 and 2013,[15] while leaving students no better off or even worse off in passing other tests on the same general subject matter.[16] In other words, it's not doing much to improve learning. Add to this the numerous unintended consequences of a high-stakes testing culture in education—cheating and manipulation of scores, bloated administrative costs, low teacher morale, and high teacher attrition—and the sensibility of this gargantuan enterprise is lost.

The Stakes in High-Stakes Testing

What makes a standardized test high-stakes? It might be better to ask *who* makes a test high-stakes and for whom. With the enacting of the George W. Bush administration's No Child Left Behind (NCLB) law in 2002, the nation raised the stakes for states, districts, and schools. The law was a reauthorization of the Elementary and Secondary Education Act of 1965 (ESEA),

the primary vehicle by which the federal government funds K-12 schooling. NCLB mandated that states test students in reading and math every year from third through eighth grade and once in high school; some testing in science was also mandated. The law required schools, districts, and states to publicly report overall test results as well as results for specific subgroups, including low-income students, students with disabilities, English language learners, and the major racial and ethnic groups. Yet while President Lyndon Johnson's ESEA was part of his domestic War on Poverty, an attempt to keep some American children from falling behind other, more educationally privileged American children, George W. Bush's NCLB was as much a fearful step taken to keep the United States from falling behind other, more economically competitive countries.[17] Greater "accountability" for schools and greater "choice" for parents were stated objectives of NCLB that were to go hand in hand: if their neighborhood schools failed to meet standards under the new law, parents could send their children to "better" schools on the district's dime.[18]

So federal dollars were the stakes, and the high was how high states had to jump. The NCLB required that *all* students reach grade-level proficiency in math and reading by 2014. Schools had to make "adequate yearly progress" toward this goal, meeting annual state-set targets for proficiency overall and for the various subgroups—or be labeled "failing." Under these unrealistic expectations, schools were soon "failing" left and right. They were then subject to federal interventions; after five years of repeated failing ratings, schools were subject to restructuring, even closure, and districts were subject to takeover by states. In the year following the NCLB's passage, school closings rose 58 percent.[19] High levels of closure have continued, though disruptive and of dubious benefit to the students they displace.[20]

NCLB data highlighted the achievement gap between white and nonwhite students, between rich and poor in the United States. The law also raised expectations for special education students, which many advocates for these children welcomed. A meaningful effort to close the achievement gap, however, would have focused less on outcomes than on inputs: it would have addressed such root causes of school troubles as growing childhood poverty, income inequality, resegregation, inadequate mental healthcare, and linguistic diversity. It would have asked about the impact of austerity on the underfunding of public schools. Instead, the game became closing the numbers gap, forcing some absurd outcomes.

Tervo-Desnick's highly regarded elementary school is a magnet school with a unique mission statement that attracted so many students from across Saint Paul that it had a waiting list. Its mission—highlighting student exploration, problem solving, and collaboration—appealed equally to the parents of

gifted and talented children and to the parents of children with special needs. The school became a victim of its own success because, although parents found that the school served the diversity of the student body well, the data did not. The school's achievement gap between various subgroups, driven in part by its high percentage of gifted students, was too large, costing it its magnet status. The resulting loss of transportation dollars would return the school to being a neighborhood school, essentially an act of resegregation because the school sits in a largely white area. As Tervo-Desnick put it, ironically, "That will close the gap."

One outcome of the NCLB's sorting of schools is the explosion of charter schools across the nation—6,900 at last estimate by a charter advocacy group.[21] These publicly funded schools operate under fewer regulations, an exemption justified as a route to raising test scores via competition and innovation in a supposed free market of choices for parents shopping for their children's education. Parental demand for charter schools, proponents argue, must indicate they are doing something right. This argument is challenged by the evidence, however. Overall, charters appear to produce better-than-average standardized test performance in reading and no difference overall in math, although there is sharp variation in how well individual charter schools perform.[22] The relative lack of oversight, moreover, appears to lead not so much to innovation as to imitation: charters undertake a similar or greater level of teaching to the test as do traditional public schools. At the same time, charter schools, whether they are for-profit or not, funnel tax dollars up the hierarchy, away from spending on students and on teacher pay, into the pockets of high-level administrators, management company owners and executives, and the landlords from whom they rent facilities.

Achievement gap data are wielded as a stick at every level, even if they obviously lack statistical significance, as one high school teacher we interviewed found. The rural science teacher received a stern "talking-to" one year about the gap that teacher-level data had revealed between the achievement of her white students and black students in one of her sections, or more properly, between her white students and black *student*—there was only one in the class.

Teacher Accountability on Automatic Pilot

One influential study that has fueled the push for teacher "accountability" was conducted by Stanford's Eric Hanushek. Hanushek calculated that a child with a "good" or effective teacher could be expected to make an additional $14,300 in income across a lifetime of earnings over that same child with a "bad" or less effective teacher. He went on to conduct an economistic

"thought experiment" that has become a call to action for some education reformers: what if all of the bad teachers were fired and replaced with good or great ones?[23] This dream, of course, has special appeal for proausterity and antiunion forces, which view teacher tenure and union power as costly to taxpayers and obstructive to reform efforts.

A focus on teacher quality should be a good thing. Few teachers are happy to work alongside colleagues who aren't succeeding; these colleagues can make their work harder. The project of weeding out the small minority of "bad" teachers, however, is causing a world of hurt for the vast majority of good ones—as a result of an array of robotic processes being instituted to evaluate teachers.

While it was NCLB that got the ball rolling on sorting schools, the Obama administration's 2009 Race to the Top (RTTT) initiative turned the attention to sorting teachers.[24] Those states that agreed to specific reforms the administration favored, including the implementation of specific teacher evaluation systems, were eligible for RTTT dollars. To access the funds, public schools in the state had to check off items on a long list. Their teacher evaluation systems needed to, among other things, "differentiate effectiveness using multiple rating categories that take into account data on student growth . . . as a significant factor" and reward those deemed effective with higher compensation and remove those deemed ineffective who fail to improve.[25] States rushed to pass legislation that would require variations of these systems, systems that are often complex, even byzantine and nonsensical, and tend to treat all teachers as though they were bad teachers.

All manner of problems ensue when educational bureaucracies try to "take into account data on student growth." Many K-12 teachers, for example, teach grades or subjects for which no standardized tests to measure student growth exist. Florida, where test scores account for half of a teacher's effectiveness rating, sought to solve this problem by holding teachers accountable for the scores of students they had never taught or for scores on tests for subjects they do not teach. In 2014, 70 percent of Florida's teachers, in fact, were rated this way.[26]

Student tests have proliferated in part, then, to satisfy the desire to take the measure of teachers, and to take their measure in ways that seemed objective and "fair" across districts and schools, regardless of variability in leadership. So now we have standardized tests being administered as early as kindergarten, tests that require five-year-olds to fill in little round "bubbles" on an answer sheet, although as critics have noted, some are still learning how to hold a pencil.[27] Students can be forgiven for their confusion about why they are taking these tests: In his high school newspaper, one young man complained

about the SBAC tests he faced, "I certainly realize that the government needs a way to track its teachers' progress and to improve the education system, but do [students] need to take part in that?"[28] It's easy to see how students could resent the teachers whose tests they are effectively taking for them.

The VAM methods that humiliated Carolyn Abbott are being used increasingly despite complaints that VAM data are used improperly, in part because administrators don't understand how the methodology works. In 2014, the American Statistical Association, which does understand how it works, published a report outlining its concerns about the use of VAM in high-stakes situations such as determining teacher performance and pay, but this caveat hasn't stopped states from passing into law new teacher evaluation systems that rely on them for just this purpose.[29] And instead of asking why we are using this ill-suited tool, tremendous research efforts have gone toward trying to fix the machine, which can have the unsurprising result of making it yet more onerous.

Free-market-focused reformers refuse to give up on the idea of VAM and on merit pay; they believe that a meritocracy among teachers can be created, which in and of itself will improve teaching and learning. They often claim that transforming the current seniority system with a merit system will make the profession more attractive to a better class of candidate: more intelligent, ambitious graduates from the best colleges who demand to be rewarded for their hard work and talent. This is a disingenuous claim, however, when the national average starting pay for teachers is $36,000 while nursing offers starting salaries of $55,000, engineers start at between $50,000 and $100,000, and entry-level jobs in investment banking average $114,000 in salary and bonus.[30]

It is hard to imagine merit pay being attractive to a new college graduate after talking to one such as Lindsey McClintock, who quit teaching after just four years. Under Arizona's plan, her year-end "bonus" depended on her third-grade students' performance on state standardized tests. Lindsey was under pressure because the test scores determined the size of this bonus, "which is very important because for summer we don't get paid. It is very stressful." She described how her anxiety rose each spring as testing approached: "I don't want to make it about money . . . but at the same time I do have to still pay rent and make my car payments in June and July. So I try to save a little from each paycheck around this time in preparation in case I don't make it. You know, it's a teacher's salary—it's not like there is a lot left over from each paycheck for me to put away."

One midcareer science teacher we met had deep concerns when a merit pay plan was proposed in her state, South Carolina. The bill required that 50 percent of her evaluation be "based on evidence of growth in student

achievement," wording she found problematic, especially as she taught a subject not covered by state standardized tests. What, then, would provide evidence? How would growth be measured? These were just a few of her questions. "Any teacher knows that scores on a test may vary greatly from year to year," she told us, "although she may have taught the material using the same practices. What is different is who walks through those doors in August and what their prior experiences have been. Did they travel to the Caribbean this summer or did they get bounced between foster homes?" She concluded, "Performance-based pay is scary. I get nervous enough when I am waiting on my AP [Advanced Placement exam] scores without the threat of a pay cut or the promise of a bonus."

The newer automated teacher evaluation systems are putting teachers under a great deal of stress.[31] They are also requiring teachers to do more data collection and paperwork, a sort of jumping through hoops that diverts their time and energy from better use. As Illinois English teacher Gary Anderson put it, teachers now "have to prove all the time that we're not stupid, lazy, and dishonest. I have to do all this stuff that doesn't really matter in order to prove that I'm competent? I could be serving children a lot better if the starting point was, okay, let's assume that he is competent, honest, and hardworking."

While these systems do not wholly depend on test scores and complex regression models, their other elements are also going on automatic. Administrator's observations, long the heart of most teacher evaluations, are undergoing changes meant to make them more "objective." While in the past, a principal might have visited a teacher's classroom, taken notes, and discussed the observations with the teacher before writing up a report, today's principals are making their rounds with extensive matrices in hand. The Boston Public Schools' rubric for teacher evaluation is fairly typical in requiring administrators to rate teachers on thirty-three "indicators" across four "standards."[32]

Ironically, although armed with these new rubrics, principals are questioning their ratings. Researchers have found them aligning their observation ratings to the VAM ratings as they assume that the computer knows better than they do about the humans they hire, train, and work with—or as they get directives from above to ensure that their observational scores confirm the test scores.[33]

All of these complex systems require new technologies, so after they've scored their rubrics, administrators are entering the results in teacher evaluation software with such names as EvaluWise, ProTraxx, and TeachPoint. Converting to these new systems has proven time-consuming and burdensome. It is turning administrators from reflective mentors into data technicians and turning performance review meetings into data review meetings, fundamentally

transforming the relationship between administrator and teacher. One Delaware teacher's evaluation meeting with her supervisor was taken up with fixing problems in online forms created either by software glitches or human confusion over the system's workings; nothing substantive was discussed. Yet this came as a relief to the teacher, since in an earlier meeting the administrator had asked her the same rubric-derived question over and over again, as though he were a malfunctioning program that needed a reboot.

Teaching to the Script and Heading for the Exit

These new evaluation systems, meant to push out teachers of lower quality, are frustrating all kinds of teachers; the upshot is that many of the teachers quitting the profession are some of the best—exactly the ones these systems are meant to reward.

Roboprocesses deskill, as Gusterson has pointed out in the introduction to this volume. Although it might seem hard to imagine that one could deskill a professional teacher, "scripted curricula" have done just that. Scripted curricula are prepackaged programs purchased by districts that require teachers to follow precisely delineated lesson plans to teach specific material. These programs have risen in popularity in response to the rise in standardized testing and its stakes, as districts seek to ensure that all teachers are teaching the material that will be tested.[34]

Scripting is another factor pushing attrition. As recently as the turn of the twenty-first century, before NCLB and RTTT, teachers exercised meaningful control over curriculum and instruction—that is, over what they taught and how they taught it.[35] Today, increasing numbers of teachers are asked neither to develop and tailor curriculum to their particular student population nor to make informed instructional choices about how or when they deliver that curriculum. They are being provided instead with a scripted curriculum.

When we observed Lindsey McClintock in her Arizona classroom, she was reciting scripts from a reading program called Fundations. At that same hour of that same day, she told us, every other third-grade teacher across the district was, as mandated, on the same page of the same script. She would have to read aloud from the Fundations teacher guide, she told us, if she hadn't memorized it.

In schools where scripting is employed, teachers can expect to be popped in on by administrators checking that they are on the correct page that day, although as teacher Gary Anderson put it, "If somebody else writes the script and then I'm evaluated on how well I read the lines, that's not evaluating me at all." It's evaluating the robot the teacher has become.

Testing as Profit Center

Instead of curriculum driving assessment, assessment is driving curriculum. As Bill Gates explained at the 2009 National Conference of State Legislatures, "When the tests are aligned with the [Common Core], the curriculum will line up as well."[36] And he was right.

In the years following his statement (and despite some states dropping Common Core standards after their initial adoption), a gold rush to create Common Core curricula to prepare students for the tests ensued. While textbooks have long been big business, historically most teachers could decide when, whether, and how to utilize them. Shackling teachers to curriculum packages (which can include books, lesson plans, videos, workbooks, handouts, quizzes, manipulatives, posters, practice tests, computer software, mobile apps, and more) means textbook writers have access to a dramatically expanded market. Multinationals such as Pearson, with a market capitalization of $17 billion, are benefiting the most from this test-to-text pipeline. Pearson—producer of many state standardized tests and both CCSS tests, Scott-Foresman and Prentice-Hall textbooks, and scripted programs such as Reading Street—is the world's largest publisher, but it now calls itself an education company.

The market for scripted curricula has grown in tandem with the growth of alternate routes to the classroom, such as that provided by Teach for America.[37] These programs, which vary widely in form, allow aspiring teachers to circumvent traditional teacher education programs. Some put recruits in charge of students with as little as a few weeks of training, giving rise to the need for a scripted curriculum. And although new or inexperienced teachers might benefit from a script, these scripts essentially keep teachers new and inexperienced. So too might other, more technological forms of scripting that are being introduced: in some schools, teachers wearing earbuds are coached in the classroom by administrators who tell them exactly what to say, how to move, and how to react to students.

Scripting, whether to the Common Core or another set of standards, reduces teachers' roles in key educational decisions, contributes to the idea that teaching requires minimal training, and deskills teachers, who never learn how to develop and adapt curricula for specific groups of students. As Vanderbilt's Richard Milner put it, "In this view, teachers are to act as automatons rather than as professionals solving the complex problems of teaching and learning. Teaching is seen as technical and mindless."[38]

When teaching becomes technical and mindless, and new teachers and old are teaching to the same script, schools have permission to hire the cheapest

labor available—which they are already doing. The percentage of inexperienced teachers in American classrooms has risen from 17 percent in the late 1980s to 25 percent today; and when there are too many inexperienced teachers in schools, turnover is high, school community breaks down, and achievement is lowered.[39] Although new teachers seem cheaper, they are costly because they are more likely to leave. Teacher turnover is a hidden cost for districts, a burden that now totals an estimated $7 billion annually.[40]

Making the Classroom Safe for Sameness

As both curriculum and assessment become increasingly standardized, classrooms easily become increasingly depoliticized and conformist. Many teachers struggle to take a values-based approach that takes into account the cultural sensitivities of their communities and the values of their teaching disciplines; with standardization, this approach comes to be replaced with the values of efficiency, test score maximization, data, and job retention. Teachers also struggle to take advantage of their and their students' individual strengths, talents, and ways of seeing the world. Combine scripting with cuts in social studies, and vigorous discussion and debate about political and social issues starts to disappear from the classroom.

Contemporary American political economy has helped structure the new educational machine and is set to keep it oiled and running. Sharply rising inequality and the achievement gap that has resulted from it have supported the testing regime of NCLB and RTTT. Important, too, has been the selling of the idea that the market, not government, would do a better job of distributing educational goods. This approach has resulted in questioning whether or not teachers provide an essential public good and in a new chapter in the war on teachers, to which the new teacher evaluation systems and the trend toward scripting are responses.

Roboprocesses, this book shows, are everywhere, but education is particularly liable to see them hypertrophy. It is a gigantic institution with a huge captive population of students and teachers ripe for quantitative evaluation, and it has a large and growing number of administrators whose labor is available for running those roboprocesses.[41] It is important to note that testing, curricula, and educational technology are all growth industries that have excited Wall Street and are developing into a lobbying juggernaut. In announcing News Corporation's acquisition of Wireless Generation, which "provides mobile and web software, data systems and professional services that enable teachers to use data to assess student progress and deliver individualized instruction," Rupert Murdoch proclaimed, "'When it comes to K through 12

education, we see a $500 billion sector in the U.S. alone that is waiting desperately to be transformed.'"[42] The result is a shifting of tax dollars from human teachers to the corporations peddling pieces of the robot.

If the United States seeks a model for education reform that achieves the objectives of a high-quality teaching force, a curriculum of deep learning that prepares its citizenry for the challenges of the twenty-first century, and a system of schools that minimizes achievement gaps, we need look no further than Finland. That nation has produced a system of schools of remarkably equal quality, not through a regime of standardized testing and roboprocesses but through a regime of adequate and fair school funding and great teacher autonomy.[43] There, however, comprehensive education reform went hand in hand with comprehensive economic reform and a genuine and collaborative effort to tackle the root causes of poverty and income inequality. That seems an unlikely goal in our divided nation, even one in which, in late 2015, Congress finally reached agreement on the reauthorization of ESEA. The new law, dubbed the Every Student Succeeds Act (ESSA), removed a few of the damaging elements of NCLB and RTTT, including dictates about the specific ways in which student test scores must be used in teacher evaluations.[44] Touted as providing more power to states and districts, ESSA seems likely though to lead to only incremental changes. States and districts are now provided some choices of standards, tests, and accountability, but no meaningful changes were made in the federal government's testing and reporting requirements. American students will continue to be overtested; American teachers will continue to be deskilled. One provision of ESSA actually loosens requirements for teacher preparation.[45] Critically, the vast majority of roboprocesses established in the wake of ESSA's predecessors and the ideology that facilitated them will continue to steamroll on.

Still, there is hope. Across the country, students have responded to excessive testing with protests and boycotts. Some parents, particularly on the political left, have responded with a vibrant "opt-out" movement, and others, particularly on the political right, have pushed back on the Common Core. This combined pressure has led to a number of states abandoning the Common Core and its Pearson-produced tests. Teachers, who generally have feared reprisals for speaking out, have been emboldened by student and parent action; more are becoming vocal about the impact of a testing culture on their students and on their profession. The passage of ESSA and its improvements, though small, are a result of this activism. Resistance to the installation of a profoundly pro–school choice, proprivatization secretary of education at the federal level, Betsy DeVos, has been resounding. Educators have also become more vocal about the austerity measures that have led to both to school

budget cuts affecting their students' learning and to their salaries declining in real terms since the early twenty-first century. Strikes and actions by teachers suffering from some of the worst conditions, including those in West Virginia and Oklahoma, have been effective in forcing elected officials to spend more on education.

While the dysfunctional responses of some educators to the rise of roboprocesses, such as those in the Atlanta test cheating case, have grabbed the headlines, for years, some districts have managed to work within the confines of oppressive teacher evaluation laws to invite teachers into a more collaborative, human, and humane process of evaluation focused more on developing teachers than on processing them. This effort has required more work from administrators, who must resist abdicating to the machine, and some are doing it. And for years, teachers have quietly been finding positive ways to teach beyond limiting visions of education. "Teaching under the table" is how one teacher described it; these teachers continue to teach the content or with the methods they know lead to learning despite directives or in addition to them. They continue to build in time for recess, encourage creativity and diversity of thought, and teach social-emotional skills. Behind classroom doors and now, in the public arena, with the support of increasingly activist students and parents, they seek to retain their professionalism, to teach the whole child, and to fulfill the broader, humanistic aims they see for American education.

3

Detention and Deportation of Minors in U.S. Immigration Custody

SUSAN J. TERRIO

I met Antonio in a secure federal detention facility for unaccompanied, undocumented minors outside New York City in December 2009. Then seventeen years old, he had been brought to the United States at the age of three and lived in a mixed-status family that included U.S. citizen siblings and an undocumented mother. He had spent his childhood in New York City and attended school there. He had no memory of his country of birth, Mexico, and spoke only broken Spanish. After opening the doors between the cars of a moving subway train, he was arrested by transit police, transferred to a police station, and ultimately jailed at Riker's Island juvenile detention facility. When asked about his family by the Immigration and Customs Enforcement (ICE) agents, Antonio insisted that he had none. He knew to keep his mother's undocumented status a closely guarded secret because of the threat of deportation that hung over the family. Had she been apprehended, her three children—Antonio and his U.S. citizen siblings—would have been left alone or placed with foster families. Antonio believed that growing up in the United States made him a legal resident. After his arrest, he learned for the first time that he was "illegal." Antonio was classified by ICE as an unaccompanied alien child (UAC), indicating that he was under eighteen years of age and without family in the United States, and incarcerated until his transfer to federal custody for minors.[1]

I attended the "Know Your Rights" orientation conducted by legal aid attorneys from Catholic Charities in New York at the facility where Antonio and the other "internal apprehensions" were held. Like him, three of the four had lived in the United States for at least five years. Although the attorneys were legally prohibited from directly representing the detained youths, they were required to assess his potential eligibility for legal relief under U.S.

immigration law and to explain the detention procedures in immigration court. Antonio was mystified, asking, "When did I become an immigrant? I been here since I was a baby. I learned to read and write here. Will that change the judge's mind? Will they allow us to stay?"

Although he did not realize it at the time, Antonio was fortunate. He could have been deported to Mexico without a hearing in immigration court. This had happened to another young Mexican, Jorge, after his first apprehension by immigration authorities in Arizona. I will discuss his case later in this chapter. Or Antonio could have spent years like Martin, whose case I will also describe, trapped between overlapping state and federal enforcement systems without competent legal representation. Martin was caught in a vicious circle of coercion by drug traffickers operating in the United States and Honduras, unauthorized border crossings, repeated apprehensions, detentions, and deportations.

Robodetention and Removal of Undocumented Minors

The apprehension of undocumented, unaccompanied children ensnares them in two parallel but separate federal systems: mandatory detention in government facilities and removal proceedings in immigration court. The children enter a highly bureaucratized detention system that encompasses Border Patrol stations, ICE holding centers, subcontracted federal facilities, local jails, for-profit prisons, and immigration courts. This system relies on a disjointed patchwork robomaze of federal laws, local ordinances, provisional regulations, state-licensing mandates, and computerized tracking systems using integrated Federal Bureau of Investigation (FBI) and Department of Homeland Security (DHS) data banks.

Since the emergence of the custodial system for minors in the 1980s, its bureaucratic procedures have become rationalized and robotic; they are automated to assess and contain risk through the apprehension, classification, and immobilization of a population deemed to be at once vulnerable, burdensome, and potentially threatening. They are organized to routinely and persistently align with the gatekeeping functions of the federal enforcement agencies—ICE and Customs and Border Protection (CBP) and the federal immigration courts. The result is a system that is oriented toward three outcomes: the immediate deportation of the vast majority of Mexican minors; the self-deportation of Central Americans, some of whom spend long periods in detention with no set end point; or the release of most juvenile detainees in the United States but without granting them formal legal status.

In 2014 the United States saw an unprecedented surge of undocumented migrants—children alone or with single mothers—as murders by criminal

gangs and drug cartels soared, violence against women exploded, and the rule of law disintegrated in the Northern Triangle countries of Guatemala, Honduras, and El Salvador. The Obama administration responded with a set of aggressive enforcement and deterrence policies. In practical terms this meant the continued expansion of large-scale detention centers for unaccompanied minors; the reinstitution of presumptive detention and expedited removal for families without papers; fast-track adjudications in immigration courts; the militarization of the Mexican-Guatemalan border; and the U.S. outsourcing to Mexico of border interdiction and the summary deportation of Central American minors.

Since 2017, the Trump administration has expanded enforcement priorities so broadly as to render the term *enforcement* meaningless.[2] In a February 20, 2017, DHS memorandum, the government announced that all undocumented immigrants had become targets for apprehension, detention, and deportation.[3] These policies vastly expand the definition of "criminal aliens" and the priority categories for deportation, increase detention beds, discourage asylum seekers in violation of U.S. and international law, prosecute the parents of unaccompanied minors who pay smugglers to bring their children to the United States, and, ultimately, speed up deportations. The U.S. attorney general Jeff Sessions broke new enforcement ground by announcing a zero tolerance policy in April 2018 that criminalized all illegal entries, including asylum seekers, and mandated the separation of children from their parents after apprehension. It had the collateral effect of recategorizing children with families as unaccompanied minors and sending thousands of them to detention facilities alone.[4] The June 20 executive order that ostensibly ended family separation replaced one horror with another. In attempting to meet the court-imposed deadline for reuniting families, only one-third of the parents were "deemed eligible" for reunification, and many attempts to reunite families failed because the government had already deported the parents or could not locate them within the immigration detention system.[5] Aspects of the enforcement regime are selectively and chaotically managed through robotic mechanisms that frequently produce bad outcomes for undocumented child migrants. These systems function unaccountably and at cross-purposes. Algorithms are represented as lending consistency, uniformity, and order to detention and deportation decisions. They are often invoked generically to legitimate a process that is in reality capricious, inconsistent, and blindly cruel in its functioning. Lawyers, social workers, and others attempting to intervene in these processes refer constantly to rules and protocols, which they manipulate in an effort to mediate negative outcomes. Nonetheless, these rules and protocols gloss a darker, more disordered reality where life-changing

decisions are made with astonishing speed based on incomplete or incorrect knowledge that erroneously claims to be objective and complete.

The Disempowerment of Migrant Children

Unaccompanied children and youth enter a system where the government—the Department of Health and Human Services (DHHS) through the Office of Refugee Resettlement (ORR)—assigns itself as their legal guardian, making all decisions regarding placement in custody, medical and psychological care, legal screening, and release from custody. But at the same time, DHS prosecutes them in immigration courts for unlawful presence. Because immigration violations are civil, not penal, infractions, those prosecuted for immigration offenses are forced into a system where they have no guaranteed access to government-funded attorneys or child advocates—not even for the youngest children. After entering the system, they confront limited avenues of legal relief and petition federal immigration courts where adult standards are applied to minors. Available resources go to electronic detection, risk assessments, psychosocial evaluations, preliminary legal screenings, detention bed space, staff recruitment, immigration adjudications, and deportations. Legal representation and child advocates for all children in immigration court, comprehensive postrelease tracking, and long-term social services are not funded.

Detained children may come into contact with as many as fifteen state and federal agencies, each with its own bureaucratic norms.[6] As a result, they have been subject to the vagaries of overlapping jurisdictions, conflicting mandates, and haphazard controls. The rationalized process instituted to rapidly identify "UACs" is frequently based on incomplete, misleading, or incorrect information. It obscures the existence of family relationships, mischaracterizes the child's background, and has markedly different effects on the eligibility for protective status. The custodial system actually works to turn children like Antonio who have families in this country into unaccompanied minors who are detained, according to government authorities, "for their own protection." Once inside, they are trapped within a system that produces what it is meant to contain or transform—"Unaccompanied Alien Children (UAC)" marked for removal or mired in legal limbo. Moreover, as is often the case with roboprocesses, federal staff members have little autonomy to override bureaucratic controls and to exercise professional discretion in the face of the robotized processes that determine the disposition of individual cases.

The detention system for unaccompanied children is an expanding leviathan that was slated to cost taxpayers more than $1 billion in 2018.[7] The total

number of children in detention skyrocketed from a range of 6,000 to 8,000 in 2009 to 59,170 in 2016 before decreasing to 40,810 in 2017.[8] The number of facilities to hold them ballooned from 39 in 2009 to 136 in 2017, with plans to add megafacilities in 2018 that would house up to 1,000 unaccompanied minors.[9] By June 20, 2018, more than 2,634 separated children were detained in large facilities operated by ORR. Some were "tent cities" hastily constructed near the U.S.–Mexico border. One county official described the detention camp in her Texas town as a "mini-prison."[10]

A Detention System Emerges

The creation of a presumptive detention system dates to the mid-1980s, when U.S. immigration authorities were pressured to the stem the tide of unaccompanied minors fleeing civil war in El Salvador. Until then, U.S. immigration authorities had routinely released apprehended children on bond to family members (regardless of immigration status) or to community groups. Faced with a growing humanitarian crisis, Immigration and Naturalization Service (INS) authorities abruptly changed course in the 1980s, making automatic detention the new norm and release the exception.[11]

Minors as young as fourteen, who posed no security threat or flight risk, were incarcerated in private INS-contracted facilities in California with adult criminals and adjudicated juveniles, subjected to shackling and strip searches, deprived of basic services, and denied visitation rights with family. In 1985, a class action lawsuit challenged the government's indefinite detention and harsh treatment of unaccompanied minors.[12] In court six years later, the INS commissioner, Harold Ezell, conceded that INS facilities were deplorable but insisted vulnerable children could not be released "to just anyone."[13] The plaintiffs insisted that the INS policy was a thinly veiled attempt to apprehend and deport the parents of incarcerated juveniles.

After years of litigation, in 1993, a majority opinion by Supreme Court Justice Antonin Scalia affirmed the government's right to detain minors for unspecified and prolonged periods of time pending release to approved sponsors and an appearance in deportation proceedings.[14] Faced with continuing legal challenges, in 1997 the federal government reached an agreement with the plaintiffs. The Flores Settlement Agreement (FSA) establishes minimum standards for the humane treatment of detained minors, stipulating that minors be held in "the least restrictive setting" and promptly released to sponsors approved by the government.[15]

Despite some additional protections mandated for minors in federal custody,[16] Congress has repeatedly failed to codify the FSA by legislating minimum

detention standards and by instituting independent oversight mechanisms. Thus, a voluminous set of "provisional guidelines" guides daily operations in federal facilities. Even as government procedures stipulate the use of child welfare practices that promote "positive development and self-esteem," it uses a detention model based on institutional confinement in closed facilities rather than placement in the home or community.

Security First

Despite legislation passed in 2008 to protect Mexican minors who express a fear of persecution or trafficking, most are immediately deported.[17] Those from Central America or other countries are transferred to the federal facilities operated by the ORR. Although the government justifies custody as necessary to protect a vulnerable population from "smugglers, traffickers and others who would victimize or exploit them,"[18] in reality security is the major focus. First, officials from the enforcement branches of DHS—that is, CBP and ICE—serving as gatekeepers make the critical determination of whether each child is younger than eighteen years old and without family in the United States to care for him or her.[19] These determinations about family are often, in fact, inaccurate. Only those designated as unaccompanied are eligible for transfer to ORR facilities.

Second, ICE officials gather data on family background with a focus on risk and security. Based on research I conducted from 2009 to 2012, the ORR team used the ICE data as the primary basis for placing the child within a tiered system of closed facilities organized by three security levels: (1) low-security shelters, (2) medium-level staff-secure facilities and therapeutic treatment centers, and (3) high-security juvenile jails.[20] Available bed space, age, gender, geographic location at apprehension, and evidence of psychological trauma were important but secondary considerations in the placement decision. Children apprehended alone are people out of place and in need of control. They are understood to be both *at* risk and *the* risk.

Despite repeated government pledges to improve efficiency and enhance oversight, major problems remain. ORR frequently received incomplete background information from ICE and CBP, particularly for children like Antonio who enter the immigration system by way of state child welfare, juvenile, and criminal justice systems. In response to numerous complaints from subcontracted agencies across the country, ORR partnered with the Vera Institute of Justice in 2008 to improve the initial placement process by developing more "objective" measures of risk—in other words, by introducing a roboprocess. They designed a standardized in-house questionnaire that quantified

the threat level posed by and faced by the child with a numerical score and matched it to the appropriate level of custody. Launched in 2009, the new questionnaire is a classic roboinstrument. It was intended to identify risk factors that threatened both an initial placement and a safe release while safeguarding the child's best interest. In fact, the questionnaire provided quantitative cover for a placement process that remained both inconsistent and subjective. This roboinstrument did not so much determine people's fates on the basis of actual recorded behavior—as a credit score might, for example—as provide a legitimating illusion of orderliness for a process deeply haphazard and capricious in its functioning, like the mortgage bureaucracy described by Noelle Stout in chapter 1 of this volume.

The Placement Tool

The scoring instructions assigned numerical weights to prior arrests, charges, and adjudications within the U.S. juvenile or criminal justice system, to suspected gang involvement, and to the probability of flight risk. Because of the fears of gangs, the questionnaire included a separate score for gang involvement. ICE officials were the ones who identified suspected "gang bangers," often with little or no proof. The questionnaire also flagged minors who had a history of disruptive behavior in government custody. It assigned scores that increase with the gravity of the act and the number of incidents. It considered dismissed charges the same as active charges and scored serious threats of violence or flight the same as actual incidents. The sum of the highest risk scores determined the initial placement score. These scores were correlated to the level of security, low scores indicating placement in a minimum-security shelter and higher ones in a more restrictive facility. Because of his arrest, ORR scored Antonio a 6 on the risk scale and sent him to a medium-security facility (as mandated for a score range of 6–12).

A third section of the placement tool focused on the child's psychological profile. Despite the rhetorical commitment to protect minors from the trauma of human trafficking or abusive smugglers, little attention was given to the child's psychological profile. In contrast to detailed scoring values given for offenses or escapes, "the child's mental or therapeutic needs" carried no numerical value. Federal staff were instructed merely to consider the possible link between past offenses and "a therapeutic need." In the putative absence of mental health issues, the instructions directed staff to submit only "the most serious and highest scoring value" per question. Judging from the few available residential therapeutic facilities—only three in 2017—mental health was a secondary consideration in placement decisions.[21]

Despite the depiction of the questionnaire as a fail-safe, objective placement tool, federal staff and immigration attorneys described placement as a flawed process that was often compromised by missing information. This description was particularly true for youth who were deemed security risks. Senior staff members were theoretically permitted to exercise their individual discretion. Nonetheless, interviewees indicated that when supervisors did exercise discretion, they tended to request more-restrictive placements for youths with any history of offending, whether or not there were formal charges or court adjudications, particularly when drugs or gangs were involved.

Scott Lloyd, the 2017 Trump appointee as ORR director, has made security and risk factors—particularly any history or even suspicion of gang involvement—the primary criteria in placement and release decisions for detained minors. All unaccompanied minors who report or display gang affiliation of any kind are automatically placed in secure detention and may not be released without the director's personal approval.[22]

A Homelike Setting?

Most federal facilities are privately contracted by the ORR and typically house large numbers of children—two hundred. They are located in remote border or rural areas to reduce costs and to facilitate the children's removal if ordered. Government regulations call for children to be held "in a non-institutional home-like atmosphere of care." Between 2009 and 2012, when I made twenty-six site visits to federal facilities and programs in nine states, I saw firsthand that custody is not anything like home. Although there are now more alternatives to institutionalized settings such as group homes, independent living, and both long-term and temporary foster care, the government has contracted with more large-scale detention facilities. All closed facilities, even low-security shelters, are organized on a penal model. Even in the absence of high fences or barred windows, this means locked or monitored entry, exit, and movement within the premises. Facilities use twenty-four-hour camera surveillance and continuous supervision. Federal procedures require specific staff-to-client ratios and line-of-sight checks at intervals determined by the security level of the facility. Minors attend school inside the shelter, play sports within fenced areas, and leave the facilities only under "escort" for court appearances, special medical or psychiatric treatment, and occasional community outings.

Federal procedures explicitly exclude "laying hands on the kids" as a means to correct unwanted behavior. Instead, staff members used incentives and restrictions so that youths adapted quickly by internalizing a detailed catalog of prescriptive rules. All of the federal facilities I visited used a system

of levels and points correlating then with rewards or punishments. Martin remembered, "There was level 1, 2, and 3. You start at one level, and if you behave OK, you stay there. But if you say bad words, if you don't go to your room when they tell you, if you don't respect the staff, if you touch a friend anywhere, they lower your level and they can kick you out." Those who acted out could be moved to more restrictive facilities and held for longer periods or diagnosed with psychological disorders and managed with psychotropic medicine—or both.[23]

Under pressure to turn over facility beds quickly, either through release to approved sponsors or for removal from the United States, federal staff worked rapidly to neutralize potential problems and to maintain order. They used intensive, panoptic systems of behavior management drawn from social work, psychology, and psychiatry that were punitive and infantilizing. These systems were designed to enforce conformity and to discipline detained youth to police themselves. Establishing a record of good behavior was imperative for rapid release to biological families, foster care, or group homes, whereas problem behaviors—such as sleeping in class, nonparticipation in activities, unauthorized movement, swearing, noncompliance with staff orders, and verbal or physical aggression—could trigger prolonged periods of detention through a transfer to a higher-security facility or removal through an order for voluntary departure or deportation.

In response to criticism from nongovernment organizations such as the Women's Refugee Commission, the roboprocesses governing placement and release began to shift. By 2017, more than 90 percent of detained minors were released to approved sponsors including family members, foster care, or group homes. Under ORR director Scott Lloyd, only 12 percent of those children detained in medium- or high-security facilities had been released to sponsors by May 2018. Since Lloyd must personally approve the release of those who are labeled as "dangerous" due to suspected gang involvement or criminal activity, these youths can languish in detention on average eight months.[24] More alarming is the inability of the ORR to collect reliable data on the subset of children who were separated, recategorized as unaccompanied alien children, and detained in federal facilities under the zero tolerance policy.[25] The database system that ORR has used since 2014 to track unaccompanied minors in custody was plagued with problems. It did not allow ORR staff to add new data categories, such as the names and locations of parents who had been separated from their children during apprehension. When the mass separations began, ORR was overwhelmed with files sent from Border Patrol personnel that were "a mess." Many files had incomplete or inaccurate information on the separated children.[26]

Antonio's Case: Medium-Security Detention

As is so often the case with roboprocesses, actual processes often deviate markedly from idealized scenarios. ICE receives information on unaccompanied children after their arrest by local police through agreements with law enforcement and informal mechanisms whereby state police, probation officers, juvenile court personnel, and child welfare agencies contact immigration authorities. In 2009 youths like Antonio were not targeted because of criminal or delinquency offenses but because of their unlawful status. Whereas under the Obama administration, ICE claimed that it focused internal apprehension efforts on "serious criminal aliens," under the Trump administration, immigration enforcement targets any noncitizen. Those who have had contact with law enforcement, including undocumented youths arrested or charged with minor offenses, are particularly vulnerable to apprehension and detention.

Antonio told the attorneys, "[At Riker's Island] a guy in normal clothes who didn't act like a cop asked me where I was born." His pro bono attorneys surmised that "the guy" was with ICE, based on their experience with agents who entered juvenile detention centers in plain clothes and questioned minors alone.

After the ICE agents determined that Antonio was unaccompanied and potentially removable from the United States, they issued an ICE hold on his release. Thus, at a point where a U.S. citizen youth would be released from custody to family "because the youth was never charged, faces only minor charges, is not a flight risk, poses no threat to the community, paid a bond or served a sentence, was found not guilty or had the charges dropped," undocumented teenagers deemed security risks were sent to immigration detention.[27]

Antonio was fortunate that he was apprehended in December, when overall admissions were down and a bed was available in the medium-secure wing of the New York facility. Bed space during peak admissions in the spring and summer was a constant problem, and ORR staff struggled to place unaccompanied children and youth. If there were no beds at the appropriate security level, children could be sent to facilities out of state. Antonio could have been sent to California, Ohio, Oregon, or Virginia.

Immigration attorneys reported to me that they had numerous cases of teenagers sent to large-capacity out-of-state shelters from Riker's Island after an arrest for a petty offense.[28] During peak admission periods, some were sent to jails with domestic youths who had been adjudicated for violent offenses or were held in ICE custody for longer periods. One case manager remembered

an incident from 2010: "We got a fourteen-year-old boy who was waiting to be placed because there were absolutely no beds. He was held in a hotel room in LA for three days with ICE officers. He was kept chained to a bed and unchained to eat and to go to the bathroom. He ate ramen noodles and watched television for three days straight."

Placement was especially complicated for those with more serious offenses. I met an angry young man from Arizona in a government-contracted juvenile jail in rural Virginia. He had served a one-year sentence for assaulting his stepfather. Instead of being released at the end of his sentence, he was held on an ICE detainer and transferred across the country, where he faced a second period of detention, this time far from his family and with no set end point. Attorneys noted the obstacles that such youths faced after apprehension. Undocumented teenagers were often subject to zero-tolerance policies and diversion into the adult criminal justice system. Those charged with an aggravated felony or misdemeanors that constituted "crimes of moral turpitude" under immigration law would be permanently barred from obtaining legal status in the form of asylum or a humanitarian visa for minors suffering abuse or abandonment, victims of trafficking or crime. Similarly, those who were advised by public defenders with no background in immigration law to plead guilty to certain offenses in return for a lighter sentence could find themselves permanently ineligible for relief. In theory, juvenile records are sealed, but in practice, government prosecutors obtained and used information from these files against undocumented minors in deportation proceedings.

Federal staff complained about the inadequate screening conducted by CBP and ICE and the paucity of reliable information they received. They saw initial placement scores based on charges or convictions that were listed without any explanation, creating the perception of a dangerous youth.

Directors of low-security facilities were hesitant to accept teenagers who were being transferred from medium- or high-security ones. The need to handle kids with suspected criminal issues, gang affiliations, conduct disorders, and histories of trauma posed thorny dilemmas for staff members whose mandate was to reduce disruptive incidents and to facilitate a rapid release to approved sponsors or removal from the United States. The government commitment to help vulnerable children fleeing violence and abuse conflicted with the need to manage problem youths who were labeled high risk because of their criminal record or unruly behavior in federal custody.

I had the opportunity to interview the director of the facility where Antonio was detained. We spoke in the central office, where sixteen monitors tracked movement in and out of common areas, including the entrance,

stairwells, halls, kitchen, dining area, and recreation rooms. She noted, "You are in the [low-security] shelter now. Medium-security kids need close monitoring so we don't mix the two populations. They can't be in the same room at the same time." When I asked her to explain the difference between the security levels, she responded, "The secure kids all have charges . . . they are criminals."

Martin's Case: High-Security Detention

Another case, Martin's, further dramatizes the way, in practice, roboprocesses shift outcomes away from concerns about children's welfare in favor of a focus on past criminal behavior, no matter the mitigating circumstances. In the process, yet again, actual processes deviate sharply from idealized representations of them in official statements and formal codes. Federal regulations mandate weekly counseling sessions in custody, but those brief sessions were frequently inadequate to diagnose and treat underlying trauma or psychological disorders. Because case managers and clinicians typically lacked either the necessary skills or the time to build trust and to conduct intensive talk therapy, staff members focused on controlling the symptoms rather than the causes of behavior problems through medication. Facility staff and immigration attorneys alike reported high percentages of minors on medications to control anxiety, depression, and conduct disorders, particularly when the period of custody exceeded two months.

Inadequate screening or ineffective counseling could have devastating consequences for teenagers like Martin, a young Honduran, who was in the grip of human traffickers who operate transnationally. His mother abandoned him when he was twelve years old, forcing him to live on the street and to work at a local bakery. A neighborhood gang regularly robbed him of his wages. He found a friend, José, whose mother, although poor, occasionally gave him a place to sleep and bathe. When Martin was fourteen, the boys decided to leave for El Norte. After riding the dangerous freight trains through Mexico, José's brother arranged for a smuggler to lead them across a remote stretch of the U.S.–Mexico border for $2,500. To repay their debt, they were forced to work for a drug cartel operating in the United States. The cartel boss warned Martin that if he got arrested, he should "keep his mouth shut or die." Soon after, Martin was arrested by Los Angeles police, charged with selling drugs, held in a juvenile jail, and sent to a secure federal facility where he stayed for two months before being deported back to Honduras. He was there for less than a week when the cartel contacted him and demanded that he return to pay his debt or be killed. Because he feared for his life, Martin

returned to California to work for the cartel. Over a sixteen-month period he was apprehended, placed in federal custody, and deported twice more. After his third deportation to Honduras, Mara Salvatrucha gang members attempted to extort money from Martin and José and administered a savage beating when they refused. Days later gang members murdered José in a drive-by shooting, and Martin narrowly escaped the same fate while attending José's funeral. He fled to the United States, was apprehended in Texas, and was detained in ORR custody for a fourth time.

Despite regular sessions with case managers and clinicians in ORR detention, Martin had never described the abuse he suffered in Honduras or his trafficking by the drug cartel. Given the cartel's long reach, he was sure that they would find a way to kill him. Deprived of good legal advice, like so many unaccompanied minors, no one had ever fully explained the possibility of applying for a trafficking visa or a Special Immigrant Juvenile Status (SIJS) visa that provides legal permanent residency for minors who have been abused, abandoned, or neglected in their home country. When Martin was transferred to a facility outside California, he finally revealed how he had been trafficked. He was ultimately placed with a foster family; he thrived in their home and in the public school he attended. With the help of a sympathetic case manager and an excellent pro bono attorney, he took the first step in the application for the SIJS visa by filing a dependency order with a state family court. However, the county district attorney objected to the dependency order based on his criminal history and involvement with a drug cartel. With this possibility foreclosed, his attorney applied for a trafficking visa, but a government attorney opposed his petition. The government attorney had access to Martin's file, including confidential case notes written by the social worker and the clinician. He argued that Martin could not be a trafficking victim given his repeated returns to work for the cartel. As this book went to press in fall 2018, a decision was still pending on his case. The processes focused on security that were used to assess his case discounted his vulnerability as a minor and his success in overcoming the obstacles of early childhood trauma and brutal coercion by a drug cartel. Instead, he was labeled a deportable criminal and held to be fully accountable.

Jorge's Case: Immigration Court

A third juvenile case, Jorge's, illustrates the dangers of moving along the deportation conveyor belt without legal representation. Although children and youth can independently seek humanitarian forms of immigration relief under U.S. immigration law, such as asylum and protection from removal under

the Convention Against Torture, they are held to the same evidentiary requirements and burden of proof standards as adults. They have to prove eligibility for forms of relief designed almost exclusively for adults.[29] Immigration law diverges sharply from mainstream approaches in juvenile and family courts that mandate protective measures by considering mitigating circumstances, demanding less accountability, particularly for youths age sixteen or younger, and viewing juveniles as less deserving of the most severe punishments. Beyond voluntary guidelines that call for a child-friendly atmosphere in court, immigration courts make no allowance for developmental immaturity, special vulnerability, or the potential for rehabilitation. Immigration judges may not consider the child's best interests as a primary criterion for legal relief—an egregious departure from recognized international standards.

When unaccompanied children are placed in removal proceedings in federal immigration courts, they enter a system with arcane rules, staff shortages, hearing backlogs, powerful government attorneys, and disempowered judges. They struggle to find pro bono attorneys familiar with immigration law and to weigh the best options given the limited remedies available to them.

In October 2010, four youths held at a secure federal facility appeared for their first hearing—a master calendar hearing—in immigration court. Only one of the four, a sixteen-year-old Mexican boy I will call Jorge, had been apprehended once before. He had lived in the Phoenix area and worked at a fast-food restaurant before being arrested during a routine traffic stop. He was immediately deported without a hearing in immigration court as required by law. This time ICE agents alleged that Jorge was caught with a group of Mexican men while selling drugs. They designated him as a UAC and transferred him to federal custody.

Most master calendar hearings are perfunctory proceedings that do not usually involve pleading to immigration charges. Judges typically continue the proceedings to give detained youths time to find pro bono representation, to seek release to an approved sponsor, or to consider the option of exercising the "benefit" of voluntary departure (as will be discussed shortly). Some hearings, like this one, had much higher stakes because transporting drugs is an aggravated felony that imposes a permanent bar on legal entry to the United States.

When his case was called, Jorge stood alone opposite the immigration judge and across from the attorney representing the government. The Vera Institute of Justice contracts with the government to recruit local legal service providers to screen detained youths for possible legal relief and to inform them of their rights in detention and in court. Since only one-third of detained youths find legal representation, in some courts an immigration

attorney serves as a "friend of the court," speaking on behalf of the youth but not acting as the attorney of record.[30]

The attorney who screened Jorge had advised him to ask for voluntary departure because he was implicated in a drug offense and had no prospects for family reunification. Voluntary departure, unlike a deportation order, is considered a legal benefit because it repatriates unaccompanied minors at government expense but imposes no long-term restrictions on legal reentry to the United States. It is a discretionary ruling that depends on the background—or good moral character—of the petitioner as well as the circumstances of the apprehension. It was unclear whether the judge and the government attorney would agree to a grant of voluntary departure because it is reserved for "aliens" with no record of aggravated felonies or terrorist activity. Also, this judge insisted on questioning minors without legal representation on the record about criminal activities and family reunification issues.[31]

The judge began the hearing by determining that Jorge had been notified of his rights, was informed of the immigration charges, had no possibility for family reunification, and was asking to return home. Turning to Jorge, he verified that Jorge did not fear returning to Mexico. Then the judge referred to the ICE report, noting that Jorge had been arrested while transporting drugs across the U.S. border. Jorge admitted that he was part of the group.

The judge verified Jorge's birthdate and nationality and then had him admit to the factual allegations of "coming across without documents, entering the United States illegally, without being inspected." In testimony on the record, Jorge explained that he had "crossed the border on foot" with four other men. Together they carried four backpacks with "20 kilos of drugs" and were each paid "$1,800," cash that he needed "to help his family." The judge asked for the government's position on the case. In contrast to her past practices, the government attorney indicated that she would not oppose a grant of voluntary departure. The judge granted it but delivered a stern warning: "I will grant voluntary departure because you will be in custody [and no flight risk exists]. You came into this country illegally and were smuggling drugs. This is very serious. . . . I will give you this opportunity because I hope you will leave this kind of life. It is more than deportation or jail. You surely put your own life at risk. I see that you are a boy. You will be no good to your family if you begin that life. They can't replace you if you lose your life."

Later, the attorney who spoke for Jorge explained that she had seen similar cases involving impoverished street kids who had been trafficked and forced to transport or sell drugs. What were Jorge's prospects given his testimony about transporting twenty kilos of drugs? Would that be a permanent bar to obtaining legal relief? The attorney responded, "Unfortunately, yes . . . This is

an evidentiary hearing. The judge inquires about the individual background and the kid has no attorney. If I were the attorney, I would never allow him to say those things on the record. But we know what this judge expects . . . he insists that the kids answer all his questions. If they refuse, he issues a deportation order."

This case illustrates the hazard of requiring children to appear in deportation proceedings without appointed counsel or an independent child advocate. It also reveals the limitations of a model that relies on legal screenings in detention and provides little government-funded representation. Children and adults face government attorneys whose agenda is often to avoid delays in the disposition of cases and to emphasize offenses that are aggravated felonies because these would result in deportation orders and long-term or permanent bars to legal reentry.

Despite the creation of specialized juvenile dockets in federal immigration courts, significant problems remain. UACs are told about rights they have little opportunity to exercise. In this case, the immigration judge adopted the well-intentioned, paternalistic admonitions more suited to a juvenile or family court judge but in a context that provided no due process protections. Despite the judge's apparent concern, he relied on an ICE report alleging criminal activity. The information on unaccompanied children and youth is selectively gathered by the enforcement branches of the government and shaped into an unassailable risk narrative that is used by government attorneys to argue for their removal from the United States.

Conclusion

The massive bureaucratization of custody means that from apprehension until release, minors' cases are mired in administrative complexity and bureaucratic delays. Despite a rhetorical commitment to operational efficiency through standardized regulations and rapid action, the roboprocesses at work limit transparency, enhance redundancy, restrict information flows, and concentrate power hierarchically in the hands of a few senior administrators whose decisions are difficult to review or appeal. This system frequently functions at cross-purposes and in haphazard ways to occasionally mitigate or, more frequently, to amplify their punitive effects on minors, including their ineligibility for legal status or their removal to countries they fled because of violence, abandonment or abuse.

In Jorge's case, there was a complete failure to accord due process, after a first apprehension when he was subjected to expedited removal, and a second time when he was forced to answer self-incriminating questions without an

attorney in an immigration court hearing. The judge's grant of voluntary departure would not mitigate his admission to a criminal offense that would bar him from legal reentry into the United States. Martin's and Antonio's cases illustrate both the importance of having competent legal representation and the serendipitous nature of obtaining a successful outcome in immigration court. The outcome of the case depends on the courtroom where the case is heard.

Since 2014, the roboprocesses at work have exacerbated the skewed focus on security. Accommodations were made to manage the exploding numbers of new arrivals in the summer of that year. The purported protections governing release all but collapsed. Average stays in custody were dramatically reduced and the release process was accelerated with inadequate vetting of potential sponsors There were cases of children falling into the hands of smugglers or traffickers—the very harm that the system was instituted to prevent. Despite the additional protections for unaccompanied Mexican children legislated in 2008, most are immediately removed from the United States. The percentage of Mexican children in ORR custody plummeted from 17.6 percent in 2010 to less than 3 percent in 2017 despite the deadly threats they face from criminal gangs and drug cartels.[32]

To manage the new deportation cases for UACs in 2014, the government implemented priority or "rocket" dockets in immigration courts. The creation of expedited hearings combined with the rapid release from custody had the effect of making it increasingly difficult for detained minors to be adequately screened for legal relief and to find immigration attorneys to represent them. Moreover, less than half of the deportation proceedings begun between 2014 and 2016—or 69,540 cases of UACs—had yet to be completed by the beginning of 2017. In this new climate, only 0.3 percent received some form of legal relief. The vast majority receive only "informal status" such as "administrative closure of the case." This means they are spared deportation but remain undocumented and in legal limbo. Over the same period, 12,977 minors received deportation orders, but only an estimated 1,700 were actually removed. Both groups remain in American communities in the United States while forming part of a growing underclass without the rights of legal permanent residents or U.S. citizens.[33] The processes applied to foreign children prioritize the risks they pose to American society but take little account of the many risks they live with as undocumented immigrants. The processes that purport to protect them make them more vulnerable. They have more visibility as "aliens" to enforcement agencies but have few protections to press their claims for legal status, social services, or full inclusion within American communities.

Federal authorities continue to justify detention as a humanitarian response to exceptional conditions of displacement. Paradoxically, a permanent state of emergency now exists. Detention is not a temporary suspension of law and policy in crisis situations. Rather, when coupled with deportation and release without legal status, it serves as the dominant paradigm for managing a vulnerable population.

4

A Felony Conviction as a Roboprocess

KEESHA M. MIDDLEMASS

As Brooks Johnston reentered society after serving a thirteen-month prison sentence for theft and burglary, he attempted to live a crime-free life but ran head-on into society's disapproval. He struggled to find legal employment and reliable, safe housing, and despite his best efforts to "be good," he could not overcome the negative stereotypes and automatic rejection connected to his felony conviction. It quickly became obvious to him that his conviction was going to be a constant problem: "It's a combination of everything, you know, it's a combination of actually everything connected to the conviction. I did what I had to do, survive like, you know, nothing big, like, I didn't kill no one. I didn't assault no one, didn't hurt no one. I'm like, I served my time, like they say do, but that conviction is everything now."[1] Johnston's situation results from an automated process that uses convictions to deny all felons access to economic opportunities and public benefits, regardless of the nature of their conviction, time served, or evidence of rehabilitation. His experience is not an anomaly; every year, approximately three-quarters of a million men and women are released from prisons and jails across the country to reenter society as convicted felons.[2] Some are on parole or probation, while others have completed their entire sentence.[3] Regardless of a formerly incarcerated individual's circumstances and demonstrable steps to turn his or her life around, the word *felon* ensures that punishment continues after the criminal sentence comes to an end. Society condemns the person when he or she returns to the community; public and private organizations routinely reject a convicted felon's attempts to establish a crime-free life when they apply for a job, attempt to secure housing, and try to fulfill other customary responsibilities. Advances in technology and database management make this discrimination possible, as various laws and multiple public policies use a

felony conviction as a permanent feature of a person's public record and allow that conviction to be used to automatically exclude and stigmatize the felon. Thus, the system has created roboprocesses that ensure that both violent and nonviolent felons are reviled equally.

Drawing on data collected from participants at a nonprofit reentry organization in Newark, New Jersey, I document how formerly incarcerated men and women run into the automated processes that deny them access to legal employment opportunities, public housing, and a host of other citizen rights and benefits. From February 2011 to June 2013, I learned the language of reentry by employing multiple data collection methods, including ethnography, participant observations, and more than fifty in-depth interviews. Using ethnographic principles, I first discreetly observed interactions among staff, clients, and volunteers and chronicled what was said and my own observations in a small notebook. I then employed participant observation and had informal conversations with men and women I encountered at the nonprofit. From my observations and informal conversations, I developed a set of field notes, which helped me identify several individuals whom I later approached to be interviewed. By combining multiple methods, I was able to interact with hundreds of men and women and listen to them share their personal narratives about returning home after serving time in prison. Their stories show that using a felony conviction to deny rights and benefits has a significant adverse impact on the prospects of most individuals with a criminal record. The roboprocesses that affect formerly incarcerated individuals and their families began with net-widening laws that caused felony convictions to become automatized.[4]

Net-Widening Laws

Politicians looking for an easy path to reelection often position themselves as being tough on crime and pass numerous bills to address the "criminal monster" lurking in the shadows waiting to defile "good" citizens.[5] By criminalizing a range of behaviors, such bills expand the criminal code to capture more and more activities.[6] Yet the definition of criminal behavior has not expanded much beyond the traditional nine infamous crimes English judges identified many generations ago: murder, manslaughter, arson, burglary, robbery, rape, sodomy, mayhem, and larceny.[7] When judges constructed these nine crimes, they assigned "civil death" as punishment, and men found guilty of an infamous crime were cast out of the community to become outlaws, and their wives became widows and their children orphans.[8] Today, the definition of criminal behavior is not markedly broader and has only expanded in three categories: auto theft, controlled and synthetic substances (i.e., drugs),

and violence against women and children.[9] What is substantially new is how politicians have delineated the traditional nine crimes in new ways to capture more behaviors as "criminal."[10] For instance, legislators have created a number of ways to define the unlawful killing of a person (i.e., murder) depending on the victim, circumstances, and jurisdiction.[11]

Policies and laws are an overly broad and therefore imprecise response to illegal and immoral acts, but fighting crime is a matter of public concern; therefore, criminal proceedings, convictions, and incarceration are discharged under the guise of the "public's interest"[12] or the "public's safety."[13] Legislative and judicial decisions grant government actors, such as the police, immense power to target particular groups for prolonged and aggressive surveillance, and to detain, search, seize, and arrest those they deem as criminal, while prosecutors and the criminal justice system focus their efforts on charging, convicting, and imprisoning more people and tagging them as felons. The numerous laws that support the efforts of police, prosecutors, and the criminal justice system create a phenomenon known as *net-widening*.[14]

Net-widening refers to an increase in the number of people having contact with the criminal justice system due to new policies, practices, or laws. The phrase has been applied to deterrence, corrections, and diversion programs, as well as to a broader and stronger web of policies with which the criminal justice system intervenes in and controls people's lives for a longer period.[15] Net-widening is possible due to the expansion of the number of statutorily defined crimes that focus on certain communities and increase the system's ability to arrest, charge, and convict people; the enhancement of administrative restrictions related to parole and probation; and the development of financial penalties related to crime, such as criminal justice fines and fees.[16] One example of a net-widening policy is the Sentencing Reform Act of 1984; the guidelines that emerged from this legislation created a system that made prison a default response to crime.[17] The guidelines spawned such laws as "three strikes, you're out," determinate sentencing, mandatory minimum sentences, and "truth in sentencing," all resulting in longer prison sentences for almost everyone convicted of a felony. The combination of longer prison sentences and the use of incarceration for almost all criminals resulted in a substantial increase in the prison population.[18] Because of the sentencing guidelines, the government's response to criminal wrongdoing rarely varies, even though there is a huge difference between murder and possession of a controlled substance. The singular response is to make virtually every criminal a felon, with no regard for context or the concept of "just deserts."[19] Since the 1970s, the U.S. criminal justice system has become harsh and punitive. Politicians view the criminal code and its seemingly infinite list of illegal behaviors as insufficient to "protect the

public's safety."[20] So to widen the net to reach outside the traditional criminal justice system, an assemblage of formerly discrete institutions and numerous laws across multiple policies now work in concert by using a similar language of surveillance.[21] These institutions and laws label people persistently with the word *felon*, and that label allows the system to control the social and economic lives of anyone convicted of a felony.[22]

Prisoner Reentry

Nearly 1.2 million men and women are incarcerated in state and federal prisons, and approximately 95 percent will be released to return to society;[23] national estimates indicate that between 640,000 and 760,000 adults are released from state and federal prisons each year.[24] As the number of prisoners released every year has remained stable since 2008, the population of formerly incarcerated felons living in the community continues to grow, and although the exact number is unknown and difficult to measure accurately, it reaches into the tens of millions.[25] The hundreds of thousands of prisoners returning each year, as well as those already living in the community, are all subject to a complex maze of civil penalties that, although legal, are detrimental to living a crime-free life.[26] Non-criminal-justice penalties are found in statutory codes, civil regulations, and multiple bodies of law; they differ from state to state and are applied in an ad hoc manner.[27] Scholars describe these policies as secret sentences, invisible punishments, collateral sanctions, internal exile, civil disabilities, and the collateral consequences of a felony conviction.[28] Experts increasingly recognize such legal stipulations as central to criminal justice policy,[29] as they deprive individuals convicted of a felony of a variety of public rights, privileges, and benefits after arrest, trial, sentencing, and incarceration.[30]

Due to discriminatory criminal justice practices, targeted crime policy, and racial disparities in who is profiled, policed, and arrested, African Americans and Latinos are disproportionately more likely than whites to have a criminal record.[31] Such disparities reflect the deeply embedded racist undertones of American society's political, legal, and criminal justice systems and their supporting institutional structures.[32] A 2014 report laid bare the extent of racial bias in the criminal justice system and the troubling association many whites make between blackness and criminality.[33] Scholars find that "being black" increases the chances of punitive criminal sentence outcomes.[34] As a result, scholars and racial minorities hold the strong belief that the criminal justice system is overtly racialized.[35]

Arrest patterns and surveillance of racial minority communities, social and cultural biases against criminals and racial minorities, and the belief that

a person convicted of a felony is permanently debased[36] all reinforce the idea that criminal nature is unchangeable.[37] This perception is doubly problematic for individuals released from prison who are a racial minority, many of whom return to urban core communities to attempt to reconstruct their lives.[38] Across the United States, institutions have abandoned many such communities, which has disconnected a disproportionate concentration of the most disadvantaged segments of society from the labor market. Those with a felony conviction often experience long-term joblessness and are disengaged from the larger economic and educational systems. Moreover, the reordering of the economy from blue-collar manufacturing jobs to high-wage technological and information-processing vocations, and low-wage customer service jobs have remade many urban economies.[39] The lack of societal organizations such as churches, community centers, and good-performing schools add to the sense of abandonment and magnify the effects of living in high-poverty, high-crime areas.[40]

The widening set of policies and practices create different nets of social control[41] to recapture a greater number of people already convicted of a felony who are living without social capital in an unwelcoming community environment. The effect has been a continuous downward spiral felons cannot escape: as soon as the criminal justice system captures an individual in its grasp and the state gets a conviction, net-widening policies and the automated system reject all felons from potential social and economic opportunities.[42] As I will explain in the following sections, the net of penal control expands the ability to marginalize felons to the point that they are legally disabled from accessing public programs and benefits[43] and the lack of social benefits increases the likelihood of rearrest and revocation back to prison.[44] A felony conviction is a legal disability imposed through statutory devices and administrative databases;[45] when someone is declared legally disabled, his or her body is effectively placed outside of society through roboprocesses embedded in numerous laws. Like a well-oiled machine, a felony conviction fills in gaps between the criminal justice system and public policies not connected to criminal statutes; with precision, numerous administrative databases exert power over felonious bodies and become the dominant frame in which individuals are viewed and move through the world.

The Automation of a Felony Conviction

Net-widening policies did not dictate that a felony conviction would restrict felons from accessing public benefits; rather, multiple laws unconnected to the criminal justice system reached beyond the original use of a felony conviction (that is, to declare someone guilty of a felony crime) to become routine ways

of evaluating job and social services applications. The result has been to deny felons entry into the job market and access to public housing, welfare, and a host of other social benefits, such as Pell grants to pursue higher education credits and the right to vote.[46] Automating the use of a felony conviction outside the criminal justice system required accessible databases. With advances in database management, and with the integration of government programs, criminal background checks can take place across multiple jurisdictions and policies and for different purposes. The Brady Handgun Violence Prevention Act of 1993 (the Brady Act) spurred these changes.

Prior to the Brady Act, jobs in law enforcement, those requiring security clearance (e.g., at the State Department or Central Intelligence Agency), and the U.S. military used criminal history background checks. After the Brady Act passed, firearms licensees and dealers were supposed to run instant background checks to comply with the law; they had to determine whether a potential gun buyer had been convicted of a federal felony, which would disqualify that person from completing a gun purchase. To make this screening possible, Congress created and funded the National Instant Criminal Background Check System (NICS)[47] and provided financial assistance to states to automate and upgrade their criminal records systems to connect with NICS. Under the National Criminal History Improvement Program (NCHIP), state law enforcement agencies collected fingerprints and criminal histories of those who had been arrested and convicted. Each state maintains its own state repository and database, and it uploads the master files to NICS; each state has passed its own laws regarding who can access, enter data into, and maintain the database.

Net-widening policies related to the war on drugs, together with proliferating surveillance techniques following 9/11, have led to enhanced scrutiny of people living in minority communities, as well as the entering of more information about real, potential, and dubious suspects into NICS. Consequently, NICS has become a national criminal records database searchable by such variables as name, date of birth, race, and sex. The database is accessible via the internet, and although non–law enforcement agencies cannot access the entire NICS database and master files, the increased number of laws mandating a background check[48] means that federal, state, and local agencies, as well as private companies,[49] from every jurisdiction of the United States, can use this inexpensive tool to run a nationwide state and federal criminal history records check and use the data for a variety of aims.

Criminal history background checks are now commonly used by departments of motor vehicles; landlords reviewing tenants for public, affordable, and private housing; higher education institutions hiring faculty and

determining student eligibility for federal funding, including work-study; foster care and adoption agencies; U.S. departments and agencies that issue passports and international travel documents (e.g., visas); county election offices in states that deny felons the right to vote;[50] government agencies that approve public benefits; and government and private agencies that grant the commercial driver's license (CDL) and commercial motor vehicle (CMV) license.[51] The criminal history background checks also automatically bar many people from purchasing a firearm; owning a gun if they are subject to a protective order or outstanding warrant, convicted of stalking or domestic violence, or deemed a threat to public safety; working in positions concerning children, the elderly, or the disabled; and holding employment licenses for certain positions as mandated by state and federal laws.[52] Because the national database system has automated a felony conviction as a means to deny the right to access benefits, felons struggle to reenter society and become law-abiding citizens. Through a criminal history background check, the vast majority of felons are automatically denied many social benefits, such as the Supplemental Nutrition Assistance Program (SNAP) and employment opportunities,[53] without anyone conducting an individual threat assessment or using independent and unbiased judgment to discern the level or degree of rehabilitation. In practice, automating a felony conviction casts felons out of the community just as yesteryears' judges barred outlaws.

Davis Carter is one of millions of adults who have served time in prison and returned to the community. He summed up his situation like this: "It's hard [to reenter], it is hard to adjust, and do everything, you know? Without any kinda help cuz I know how to do time, not much else."[54] Net-widening laws and the increased use of criminal history background checks mean that after people are in the system, they are more likely to recidivate and end up back in prison for committing a new crime because they can't access public benefits, secure housing, and enter the labor market.

Consequences of Felony Conviction Standardization

Although elected officials often show voters that they care by passing "tough on crime" legislation that responds to criminals harshly, research on the experiences of formerly incarcerated men and women shows that the hundreds of thousands returning home each year experience increased levels of stress and social isolation[55] and tend to return to impoverished and socially disorganized neighborhoods.[56] The automated system treats all returning felons as equally evil, so the formerly incarcerated must learn how to deal with increased surveillance tactics. Many cannot navigate the secret sentences because they lack social capital.[57]

I asked those I interviewed about the impact of their felony conviction on their inability to access social and public benefits, which creates an enduring underclass. A common refrain was that organizations which claimed to help former prisoners readjust to society could make a lot of money and so ran prisoner reentry like a business rather than a social program designed to help. Carter said, "The whole system, all that shit, it's all corporate businesslike now, like, it just is."[58]

Carter was fifty years old and had been released from prison to a homeless shelter, which, he said, was "no place to be, where there's drugs, fighting and stuff like that. The housing situation for me and people like me is not there to help, and then when you go to welfare, you get denied, so I have nothing. You have to have money to get out of the shelter system, but I can't get a job."[59] And that is the crux of the problem: the roboprocess that labels and restricts convicted felons has become universal, an integrated system across multiple public policies, and as a result the formerly incarcerated have few options.[60] Carter needed to get a legal job and maintain his employment status to apply for public housing programs. Yet despite his college degree and work experience prior to his drug distribution and manufacturing felony charges, he could not get a job because a criminal background check flagged his application and it was inevitably rejected.

Kerry Robinson explained the challenge of finding a legal job with a felony conviction on his public record: "Getting a job requires a résumé and education. Need to show that you can do the job, follow instructions, arrive on time, stuff like that. You need to invent yourself for the job you want, and sometimes you have to take the job you don't want to get to the one you want. But for us, all of us with a record, we can't even get that starter job."[61]

The hardest part of getting that first job, Tyris Thompson said, is explaining the time he spent away in prison. "That is hard, so hard, to try and tell someone who is judging you that you've been in prison. They stop listening when that comes up, but I'm not going back [to prison] so I got to do it, tell 'em, you know, or at least try."[62] Thompson constantly worried about having to go through a criminal background check; he knew that the automated process would get him rejected despite his efforts to rehabilitate himself by taking courses in preparation for getting his general equivalency diploma (GED).

The laws outside the criminal justice system that impose criminal history background checks and restrict a person's ability to work[63] form an overly broad and exaggerated response to people who have already been convicted and served their time. Hunter Williams said it seems that people consider them "guilty 'til proven innocent. Yeah, I'm guilty of a past crime, but I'm living legal and all but can't get no help. What we suppose to do?"[64] For many

participants, it became clear that following the law and filling in job applications honestly, including "checking the box" that asks applicants if they have been convicted of a crime,[65] would mean they would not be hired, and so they talked about their alternatives.

Boston King liked to be called after the city from which his grandparents came because, he said, "when I lived with them, that was the happiest time in my life." He now lives in a state of flux. He said, "I want to do right, but I walk outside my place, well, my girl's place, [drug dealers] on the corner, selling, moving like real weight, and I could go and be there doing that, too, but I have a record so we get picked up and I go back to prison and no one wants that."[66] Technically, King was homeless, and although he had a place to sleep, "my name is on nothing, so it's day-to-day like. She can put me out because I have nothing." He wanted to contribute to the household, and he talked about his efforts to secure legal employment. "Work, well, I take what I can get, less than minimum wage, whatever, because you know, I have to have a job, and I can't seem to keep 'em. I've had more jobs than anybody I know, but that's cuz I don't tell 'em, well not at first, you know, that I got a charge, but even the low-paying places will check you [run a criminal background check] at some point."[67] King explained his tactic for finding legal employment, saying that although it is illegal to lie on a job application and not check the box about having a criminal conviction, no one has been arrested and incarcerated for doing so. They may get fired, and they may have their pay withheld, but the police are rarely called. This is one outcome of the automated criminal history background check: people lie on their job applications.

The automation of felony convictions also makes it difficult to secure safe and affordable housing; men and women who are poor, undereducated, and without family support or social capital are often homeless when they are released from prison. Homeless Americans tend to have the lowest rate of income and have only one viable housing option—federally subsidized housing. Yet, the politics of fear and political rhetoric around being "tough on crime" in the 1990s led to the passage of net-widening laws related to housing. For instance, President Clinton and the Republican Congress in 1996 passed the Housing Opportunity Program Extension Act, which focused on clearing public housing of crime and criminal enterprises.[68] To achieve this goal, the law merged the Anti-Drug Abuse Act of 1988 and the 1992 National Commission on Severely Distressed Housing national report to set strict screening and eviction procedures that enforced the false notion that public housing residents were criminal.[69] The 1996 act directed the U.S. Department of Housing and Urban Development (HUD) to initiate new tenant criteria; commonly referred to as "one strike and you're out," the legislative directive

encouraged local public housing authorities to run criminal history background checks on tenants and applicants.[70] This legislative policy reinforced President Clinton's goal of making public housing a privilege rather than a needs-based program for poor people,[71] and it automatically barred anyone with a felony conviction from public housing. Additionally, the entire family of a felon could be evicted from a subsidized housing complex if a family member with a felony conviction moved in with them.[72] Exclusionary housing laws have a socially disabling psychological effect[73] and become a sentence of homelessness for many former prisoners reentering society.

The participants I interviewed and interacted with commonly declared that securing private housing was difficult without a job, but they would rather be homeless and live on the streets than go back to prison. After serving twenty-two years for a second gun charge, Thompson was mandated to live in a halfway house for a year. "But you can't get out to do a real job, so many rules and shit," he said of that experience. "Some guys can't make it and go crazy, getting out of prison but not being free, you know. Because we all homeless; ain't none of us have our own place, and that makes it so hard."[74]

William Hall spoke about living with his mother. "My mom, she like seventy, and she's taken caring of me, and I'm trying to make it on my own, but how can I? She can't do it all, but I can't get a job to move out. It's all really hard, kinda hopeless."[75]

A wide-ranging effect of the roboprocesses connected to a felony conviction is that once someone is labeled a felon and is continuously treated as a criminal, he or she is more likely to act in that manner.[76] Participants talked openly of what they did to survive the negative power of the word *felon* and how it constructs their social interactions in a negative light.[77] Since a felony conviction now leads to automatic rejection for job and housing applicants, it operates as a net-widener; once an individual is labeled a felon, intrusive sanctions are used in an effort to restrain that person from fully reentering society. Although not all formerly incarcerated men and women are equally able to transition successfully from prison back to the community, society should strive to improve reentry outcomes. Current laws need to be made precise to take into account that individuals are capable of changing and are not eternally flawed.

After a felony conviction, participants experienced automated rejection, which has a negative impact on both individuals and families. King, for instance, struggles to keep his relationship with his baby's mother together because of the constant threat that she will evict him, and he cannot live with his closest family members because they would lose their own housing. King has twin fears: even if he can miraculously secure a job, he is scared that he won't be able to find a place to live because landlords will reject him.

An individual convicted of a felony cannot become a nonfelon, and the administrative rules and roboprocesses that use a felony conviction reinforce racial and economic stratification and thus exacerbate preexisting inequalities in already hard-hit urban core communities. The automated processes of rejecting felons from opportunities that would otherwise help them live a crime-free life means that they will rarely be able to participate fully in society. A regular job is associated with positive societal gains such as tax payments, children receiving financial support, stable communities, and a place a person can go rather than hang out on the street corner. Furthermore, life-course scholars identify attachment to the labor market as important in shaping positive adult outcomes.[78] If individuals convicted of a felony cannot reconnect with social institutions, such as schools and families, and the broader economic system, then they will continue to be marginalized, perceived as a threat to society, and left further behind.

Emotions

5

Infinite Proliferation, or The Making of the Modern Runt

ALEX BLANCHETTE

On January 19, 2015, the *New York Times* set off a firestorm after publishing an exposé of an obscure United States Department of Agriculture (USDA) farm animal research laboratory in rural Nebraska. The author of the investigation, Michael Moss, worked with a veterinarian whistle-blower to reveal how taxpayer-funded government scientists were conducting experiments to alter animal natures for agribusiness's benefit. The laboratory's founding director encapsulated its mission in a 1981 essay, where he lamented the "inefficient" state of farm animal life. How could applied science accept the idea that there are fixed reproductive limits to cattle, he rhetorically asked, when other species such as catfish are capable of giving birth to one thousand times their weight in offspring?[1] In the decades that followed, the United States Meat Animal Research Center (USMARC) would strive to increase the litter sizes of pigs, cows, and sheep with the effect of generating more profit per breeding animal.

Using Freedom of Information Act requests, Moss unveiled some of the brutal consequences of the center's experiments that, according to an online commentator, reflect a uniquely "American horror story."[2] Weak unviable lambs were abandoned by their mothers and left to starve in fields unassisted by researchers. Decades of efforts to make cows systematically birth twins and triplets led to scores of deformed calves. Moss saw piles of dead runted piglets in farrowing (birthing) crates, accidentally crushed by maternal sows after overcrowding in utero had damaged the piglets' nervous system and reflexes.[3] In the face of outcry against this genetic violence, USDA Secretary Tom Vilsack ordered a moratorium on new experiments at the center.[4] Six months later, however, operations resumed with only minor changes following a preliminary report by auditors that claimed these experiments largely fell within the ethical norms of industry standard practices.[5]

Although it is tempting to cry foul, we might instead sit for a moment with the implications of the independent auditors' findings. The practices and ambitions of the center are perfectly normal. USMARC is indistinguishable from many other pivotal sites around the globe that are dedicated to actively remaking animal natures. These are the kinds of places where benchmarks are developed to feed growing populations; they are sites where industrial roboprocesses are being incorporated into animal biologies.

Indeed, what I find perhaps most jarring about sites like USMARC is how they reflect something of an unspoken consensus in global agribusiness about the future of domesticated animal vitality. Elite agricultural engineers—university scientists, economists, or public relations pundits—seem to believe that the gradual increase in reproductive capacity is inevitable. After ten years of research on the industrial production of pork, I remain struck by the fact that I have rarely read a single expert commentator forecast a future scenario where sows' litter sizes could decrease.[6] The idea that litter sizes must interminably grow has become so taken for granted that even animal welfare scientists—those people most ethically concerned with the pig's bodily integrity—have taken a measure of humane farming conditions to be whether confined sows are reproducing at high levels.[7] Within the cultural norms of some of these American agricultural engineers, an ideology of infinite proliferation has become the unstated and unquestioned goal of modern animal life. Every farm animal is—or, at least, one day should be—a catfish.[8]

I should note at the outset that I probably read the *New York Times* investigation differently than most readers, haunted by how this laboratory's biological creations are coming alive on actual farms. I am an anthropologist of labor politics who has conducted twenty-seven months of ethnographic research on factory farms in a region with a radius of one hundred miles that spreads across the U.S. Midwest and Great Plains. In this isolated rural zone, obscure multinational corporations annually produce more than seven million hogs across every stage of life and death.[9] In the process, they have formed one of history's most concentrated pockets of nonhuman animal life, a place where industrial hogs outnumber humans by fifty to one. As an ethnographer, I tried to experience the mass production of meat from as many vantage points as possible: shadowing managers as they inspected farms; taking manufacturing theory classes with executives; working on breeding farms; living in a homeless shelter for migrants awaiting a paycheck from slaughterhouses; or spending time with entrepreneurs who were developing new value in the pig's fat, lungs, and liver. My point is not to claim any kind of special authority but simply to note that I have interacted with many thousands of pigs over the course of this research project. I thought I had gained

deep familiarity with the nature of domestic swine. But reading about hidden places like USMARC makes me think otherwise. I am now forced to ask the uncanny and discomfiting question of whether I have ever encountered a living hog that was not the product of systematic and engineered forms of disablement.[10]

The pages that follow deal with the benchmarks and algorithms that are paradoxically killing the porcine species *through* increases in its proliferation. They describe how achieving an underquestioned ideal of industrial efficiency—realizing an average of thirty viable pigs per sow, per year (30 P/S/Y)—has reshaped research priorities, investment strategies, the biology of swine, and, most crucially, the character of farm labor. The *New York Times* investigation into USMARC prompted important public reflections on institutionalized animal abuse, along with how economic dictates have come to weigh heavily on sows' hormones and uteruses. But the exposé's narrow focus on a single research laboratory paid little attention to the lived effects of its porcine designs or the ways that infinite proliferation is pragmatically maintained within the barns of American factory farms. These engineering processes, I will argue, are not "just" about the exploitative authorship of porcine biology. They can concurrently be read as a matter of violence against human beings. As such, this chapter underlines the moral and emotional burden that migrant farmworkers bear once they are immersed in the biological ruins of animal engineering. It highlights the growing inequities between those who script the nature of modern animal life and those who sustain these creations. Writing against the pork industry's favored context-free physiological language of ovulation rates and uterine capacities, this chapter argues that the enabling condition of places like USMARC is subtly changing forms of human inequality in the workplace. Or, differently put, roboprocesses are shifting the lived textures of class hierarchies on farms in ways that enable incapacitated forms of life to become sustained as invisible, normalized, and unremarkable genetic norms.

The Modern Runt

Consider a strange, almost esoteric fact: in the twenty-first century, industrial capitalism has gradually been shrinking piglets across the globe. Methods for extracting human sustenance and livelihoods from the bodies of hogs changed dramatically over the twentieth century. Breeding sows went from roaming pastures and rooting in soil to being confined indoors in small metal gestation crates. A variety of historical breeds, suitable to particular climates and husbandry practices, were replaced with a pool of regularly updated

models made in isolated compounds in North Dakota.[11] Family farmers independently raising livestock alongside crops were cleared from the rural landscape, as four corporations came to coordinate the specialized production of 64 percent of American hogs.[12] In spite of these waves of industrial restructuring, however, one thing that seemed to remain a constant was the idea that a healthy newborn piglet should weigh between three and five pounds.

Though it has went unnoticed by even agribusiness's most ardent critics, by the first decade of the twenty-first century these basic dimensions of porcine vitality—what constitutes a normal pig at the moment when it enters the world—were shifting. Universities and genetics companies—initially in Western Europe, and then in the United States—were using selective breeding to develop what pork production magazines now call "the hyper-prolific sow."[13] These creatures ovulate up to 300 percent more eggs than previous generations of hogs. One result of this single-trait selection was a substantial increase in litter sizes, which altered how the future of hog farming is imagined in the planning rooms of pork corporations and the experimental farms of land grant colleges. But the drawbacks of selection for ovulation rates alone are rapidly becoming apparent. Biological engineering appears to be reaching the limits of the sow's uterus, and fetuses are being crowded and deprived of nutrients in utero. One of the results of this human-made biological rift in the animal is that growing numbers of piglets are now routinely emerging afflicted with a fragile birth weight of two pounds or lower.

The word *runt* is colloquially used in everyday parlance as a relative term, denoting the smallest or weakest animal in a litter. Runting is a naturally occurring phenomenon in swine, due in part to the shape of the species' uterine horn. Prior to the emergence of hyperprolific sows, about 2 percent of piglets were naturally born runted.[14] Runts are developmentally stunted beings, and their traumas are accentuated through malnourishment or injury from being at the bottom of the litter's social pecking order. But what ultimately distinguishes the runt is not its birth weight alone. It is instead the fact that the runt is incapable of unassisted living. Outside farm settings, runts tend to die after being abandoned by their mothers. As such, it is no surprise that popular culture has long portrayed saving the runt of the litter as an ideal of good agricultural husbandry.[15] Runts have been figured as icons of an imperfect nature that requires a skilled farmer's trained caretaking for survival, acting as a kind cultural alibi amid the unresolvable ethical tensions and forms of exploitation that inherently underlie relationships of domestication. However, what is striking is the way that contemporary factory farms are steadily reversing this ethical contract. For the modern runt is no longer a rare exception, a natural occurrence, nor can it be defined in relation to the rest of an otherwise

normal litter. On today's factory farms—where 98 percent of domesticated swine in the United States are born and killed—roboprocesses may be visibly runting between 10 percent and 25 percent of all pigs that are born in large litters.[16] They are debilitating the porcine species in ways that render it biologically dependent on workers' intimate *and* exploited care.

The ongoing normalization of runted life boils down to (in the jargon of the trade) a "key performance indicator" that is omnipresent in pork industry discussions: 30 P/S/Y. The number refers to the average number of pigs that a farm's sows birth in a calendar year. In the 1990s, 20 P/S/Y was a remarkable achievement, reserved for the top 10 percent of all U.S. farms. Soon thereafter, an influential veterinarian declared that 30 P/S/Y "is the new goal. It's in our sights, it's no longer a dream."[17] For pork industry observers, moving the statistical mean to 30 P/S/Y has become the new status to which all farms and sows must gravitate; it is deemed the measure of average porcine output required for corporations to remain competitive as profit margins tighten due to increased feed-grain costs, while the price of meat continues to fall. Trade journals publish glowing profiles of farms that have managed to reach and sustain this marker. Nor will it stop there: some individual animals are now touted to reach 40 P/S/Y, and Western European farms are now boasting of their capacity to sustain 35 P/S/Y.[18] Dedicating resources to the kinds of new porcine genetics, labor protocols, nutritional regimens, and constant impregnation that would enable 30 P/S/Y has become a basic investment metric and the quantitative baseline for evaluating a farm's efficiency using computer benchmarking software. For some companies, the choice appears as little more than a simple binary: reach 30 P/S/Y or sell the operation.

It should be noted that the necessity of reaching 30 P/S/Y is not merely a naive imaginary, or a corporate conspiracy. Unfortunately, 30 P/S/Y has come to make perfect sense within the structural logics of industrialization, which have put pressure on the sow to be remade as a biotechnology for infinite growth. In the late 1980s, hog farming began to emulate the takeover of the chicken industry of the 1970s, when corporations such as Tyson Foods contracted with independent farmers to raise chicks for slaughter.[19] Newfangled hog corporations named Smithfield Foods or Triumph moved production away from the traditional Corn Belt of Iowa and Illinois into economically depressed rural areas of states such as Missouri or North Carolina that previously housed few hogs. Between 1992 and 2004, the number of pig farms in the United States plummeted by 70 percent. In the same period, the average size of a farm went from 945 hogs raised in a year to 4,646.[20] Two-thirds of farmers moved from independently selling their hogs on spot markets to being contract laborers on their own land, raising branded piglets

on company-patented feed rations for corporate slaughterhouses.[21] This restructuring was not driven by shortages in the meat supply. The initial result of this restructuring was overproduction of hogs, a saturation of the market with pig parts. The sale price of live pigs dropped by 30 percent, leading to further crises in the 1990s that bankrupted many of the remaining farmers[22] and initiating an ongoing spiral of ever-decreasing meat prices and margins.

The contracting system has come to require a new kind of sow—or better yet, the continuous and unending "improvement" of the sow's reproduction. For companies that do not own their own slaughterhouse—that raise swine for corporate packers, under some form of contract—making more pigs with fewer sows is an obvious way to increase profit margins. For example, Berkamp Meats (a pseudonym) is contracted to sell exactly 330,000 full-grown hogs per year to larger companies for slaughter. The Berkamp Meats breeding farm where I worked as part of my research, named Sow No. 6, had space for 2,500 sows. However, I was struck by the fact that many of its gestation crates were empty. In 2010, Sow No. 6 held only 2,300 sows because the sows each produced two more pigs per litter than they did when it was constructed in 1995 (and a reduction to 2,200 was planned). Depending on the cost of feed, drugs, and energy, it takes $2 to $4 per day to house a sow. Decreasing 200 sows from each of their six breeding farms can save the company some $1.3 million per year.

On the face of it, infinite proliferation and its (current) key signpost of 30 P/S/Y might seem like an unusual milieu to think about roboprocesses. But it offers a unique vantage point from which to consider the digitalization of contemporary social *and* biological life. The new standard of 30 P/S/Y points to how computers and their attendant data sorting capacities are subtly remaking agricultural capitalism. Its very condition of possibility is the rise of digital benchmarking software and the continual redefinition of what counts as "efficient." The USDA collected basic animal production statistics across much of the twentieth century, geared toward identifying a big-picture sense of changing trends for government policy makers and economists. However, the twenty-first century has experienced the emergence of digital companies such as AgriStats that anonymously pool very fine-grained production statistics—such as the cost of medicated feed expended per pig, or the labor hours devoted to animal castration on each farm—that are voluntarily collected from corporations that, in turn, receive paid access to the data. If no one in the industry can conceive of how to put the brakes on infinite proliferation, it is partly tied to these sorts of programs that illustrate in real time the new plateaus of relative efficiency that are being achieved by some anonymous and placeless competitor elsewhere. Meetings among senior executives

at pork companies are often centered around people poring over these changing metrics on a weekly basis, attempting to locate small ways that they lag behind the global field of competitors. From senior management at Berkamp Meats to scientific engineers at centers like USMARC, the upper echelons of the pork industry increasingly organize their daily decision making, investment strategies, and scientific research priorities around digital renderings of porcine life. Indeed, 30 P/S/Y itself is a tangible symbol *created* by these programs—as a "key performance indicator," as a sort of formulaic code for efficiency—because its achievement incorporates so many fine-grained metrics from genetics to feed quality.

As such, 30 P/S/Y may seem logical and even necessary at a historical moment where animal natures can seem to be shifting and determined almost as much by abstract market prices and digital production metrics as they are by the expression of hormones. All the same, the cumulative and situational results of this digitally driven reindustrialization of swine are perverse. This reindustrialization has led to a radically unbalanced sow that is no longer able to nurse her young. Between 1989 and 2013, the average litter size in the United States increased by 30 percent, from 7.86 to 10.31 pigs per litter.[23] Even these generic numbers from the USDA's farm surveys are deceptive, for they include smaller farmers. Swine Management Services, a computer benchmarking program that includes aggregated data from 757 (mostly) corporate farms, placed the average litter size of corporations at 13.16 pigs per litter, with those in the top ninety-seventh percentile averaging 15.11 pigs per litter in 2011.[24] Moreover, new methods of genomic selection are anticipating this average to shortly surge to upward of an astounding 19.00 pigs per litter.[25] The typical sow has only fourteen functioning teats, meaning that this single-trait selection for ovulation rates on the most industrialized of farms has far exceeded the species' biological nursing capabilities. As a consequence, a large proportion of farmworkers' days are now spent acting akin to wet nurses by feeding runt pigs with bottles of powdered milk formula.

This industrial proliferation is also, paradoxically, leading to a strange sort of dedomestication of the hog. Though the fact that larger litters result in lower birth weights and less-stable pigs is well documented, scientists are still researching the physiology of this fact. What is clear is that modern runting is not uniform in its effects on populations of pigs. It exposes pigs to multiple traumas and has the effect of making bodies less predictable than in previous generations. The problem of the engineered runt is thus not just a temporary one of beginning at a small state. Intrauterine growth retardation results in an animal that develops at a slower rate across its lifetime.[26] The runt's traumas are numerous. Its number and type of muscle fibers are severely impacted.[27]

The functioning of its heart and liver is impaired.[28] Damage to the runt's large intestine means it can no longer properly synthesize some basic amino acids such as arginine.[29] The runt's brain stem is poorly myelinated, affecting the animal's coordination, reflexes, and general ability to move in the world.[30] The litany goes on. The pig is being destandardized through industrialization as runting affects each hog differently.

As the depth of trauma to modern hogs slowly comes to be acknowledged in pork industry literatures, research monies are now flowing to address systematic runting. In spite of its obvious wreckage, however, 30 P/S/Y continues unabated as an investment figure. Researchers at USMARC have moved from a focus on ovulation rates to healing piglets. These scientists are now conducting experiments to select for larger sow uteruses or increase nutrient blood flow in utero, or developing trials for drugs to supplement the neurochemical deficiencies of runted piglets.[31] Others are trying to develop special markets and meat grades for runt pigs, turning systemic disability into a niche profit center.[32] They have not yet succeeded. Meanwhile, the condition and effects of runting may be invisibly affecting every single pig born to a sow with hyperprolific qualities today, regardless of any given animal's apparent litter size, weight, or external appearance. Given the increase in embryos generated by hyperprolific sows, two seemingly identical litters of twelve pigs born could have been prenatally programmed differently by crowding and embryo death in early gestation.[33] The effects of runting may be the basic condition of porcine life today.

While most theories of industrialization's logic frame it as premised on the reduction of labor, one remarkable aspect of 30 P/S/Y is that it has come to require new intensities of human–pig entanglement to be sustained. This entanglement reflects not only the fragility of the modern hog but also the devalued and cheap state of human labor at this moment in the United States. Acts that used to be performed autonomously by pigs—nursing piglets being but one example—are now more profitably mediated by human workers. The most efficient farms in terms of P/S/Y have moved to twenty-four-hour shift work to decrease stillbirths by ensuring that the sow's overloaded birth canal is not blocked during nighttime farrowing.[34] Even with constant supervision of these pigs that are engineered to be frail, percentages of death losses prior to weaning continue to rise each year, even accounting for novel disease outbreaks.[35] Granted, it must be remembered that even with these excess mortality rates, large corporations are still managing to raise more total market hogs per sow.

As George Foxcroft, the former director of the Swine Research and Technology Center at the University of Alberta, describes the modern runt, "We

have a little pig that is severely compromised, and no amount of love, cross-fostering, treatment, or feeding will make him a normal pig. He is not."[36] The mystery is precisely how this degraded pig has been profitably sustained since the early twenty-first century. What I want to argue across the remainder of this chapter is that the runt is more than a technoscientific problem in search of an engineering solution. The condition of the modern runt's survival is—just as it always has been—a social relation that reflects as much how humans live together as it does the state of nonhuman nature.

Industrial Love

> We found that one of our biggest animal welfare problems was that some of our employees won't let the sick pigs die . . . they're invested emotionally into those pigs. It can be pretty tough. It's almost like a doctor, you know? Where you have a patient that's gonna die on you? Well, you know, that's pretty hard to take. You gotta be clinically detached or whatever. At the same time, you don't want people so detached that they see it as a piece of steel, or a rock, that doesn't have any feelings, that doesn't feel pain.
>
> A LEADING PORK INDUSTRY EXECUTIVE

One of our biggest animal welfare problems is that our employees are invested emotionally into those pigs. This remains one of the most counterintuitive statements that I encountered while conducting interviews in the offices of agribusinesses. The speaker was an executive at Berkamp Meats in his early forties named Byron Ross (a pseudonym). He suggests that one of the most significant causes of cruelty on factory farms is workers' love of pigs. We were discussing allegations of animal abuse in his barns. He went on to tell me about an impromptu visit to one of his confinement facilities, where he found employees hiding dying piglets in their coverall pockets. Depicting them as irrationally attached to industrial life forms—creatures that a cynical outsider might see as disposable "meat" destined to die—Byron claimed that these workers were desperately trying to give sick and suffering piglets "a chance to live." Searching for "Factory Farm" on YouTube generates scenes of grotesque hatred of pigs. Online videos feature enraged workers kicking and slamming pigs to death. Their message is that daily overexposure to tens of thousands of disposable animals dulls workers' ability to feel sympathy for other beings. Byron was suggesting the polar opposite: a crisis of animal welfare was unfolding due to workers' clandestine refusal to euthanize animals, the infectious result of excessive affection for pigs that is sweeping farms.

This interview took place shortly before I started working as an entry-level laborer in artificial insemination and delivery within a Berkamp Meats

breeding barn. Buried off side roads deep in the cover of grain fields, this barn—called Sow No. 6—births roughly 55,000 piglets per year. It was there that I met Robin Garcia (a pseudonym). She quickly changed how I viewed factory farms. In her words and deeds, she illustrated how Byron's ideal of "clinical detachment" had become an impossible affect to maintain given the injurious state of the modern animal. Garcia was a worker in her early thirties who, like others who occupy the lowest rungs of the factory farm's labor hierarchy, had spent much of her adult life immersed in the tactile violence of mass-producing animals. Her work was far removed from the slaughterhouse's viscera, but it was deathly all the same. She was a farrowing worker. That is, she helped deliver hundreds of piglets every day. Farrowing workers are tasked with—as Robin put it—"saving" the weakest animals from euthanasia so that they can be slaughtered for meat some six months later. She rarely dealt with healthy animals. Her interactions with pigs were focused exclusively on the most fragile specimens that modern agriculture can generate. And her job is not just ensuring the survival of weak pigs but of making them healthy and uniform by day 21 when they are moved to nursery barns.

Born in Chihuahua, Robin had spent most of her teens and early adulthood in Los Angeles. About 2003, she packed up and moved to the tranquil town of Dixon (a pseudonym), a rural outpost with a population of some 15,000, after what was supposed to be a weekend visit for the *quinceañera* (fifteenth birthday party) of an old friend's daughter. She once explained to me that she didn't imagine herself as being a countryside sort of person. But she was taken with the idea of her children growing up in the serene environs of small towns and steady jobs in a newly thriving cosmopolitan region where twenty-six languages are spoken in the tight-knit elementary schools. The only decently paying employers in the region, at least for an urban-born woman of color deemed "unskilled," were pork corporations. By taking a job on factory farms, she would join a workforce of four thousand other migrant workers and managers. When we met in 2010, she laughed at how she initially knew nothing about pigs when she had arrived seven years earlier. As she put it, "All there is are dogs over there in the city!" But by the time of our conversation, Robin had become one of the most authoritative and thoughtful farmworkers I encountered during my research.

Robin had developed an ethical approach for making pigs flourish in confinement barns, one that transformed her into a knowledgeable collector of industry's atypical life-forms. She had become a skilled archivist of the rare bodies that can only be witnessed in a concentrated large-scale breeding site, where one experiences the birth of hundreds of thousands of animals. Her means of communicating her skill at the position was based on the pigs that

she had encountered and tried to "save." When I asked Robin why she was more skilled than some of our coworkers, she replied, "What I know, what I've learned, what I've seen . . . a pig with two heads, and a pig with two bodies. A pig with a trunk. A pig with no legs. Once you see it in real life, you're just, like, 'wow!' Probably it does happen with every type of animal . . . but you don't see animals like that on TV or anything. This place is crazy."

My own days in farrowing often flew by in a blur of force-feeding powdered milk formula to dying runts or "euthanizing" them in carbon dioxide chambers refashioned from blue Igloo-brand picnic coolers. I experienced it as mentally grueling work. But Byron Ross's strange words would often replay in my mind as I watched Robin beam with pride as she went from room to room carefully inspecting new litters, seemingly impervious to the dense fecal fumes and heat from hundreds of bodies surrounding us. She felt it was her moral duty to try to save each and every pig, even if it was an impossible task.

Still, Robin Garcia taught me more than anyone else what it means to be a farmworker who labors in constant proximity to agribusiness's waning yet abundant state of life. "The most important skill is learning to love the animal," she told me. "It is hard, but I have a lot of patience, and when you have patience, you learn to love them." For Robin, being a good farmworker wasn't just a matter of mastering a finite set of tools and tasks. An ongoing ethical and moral orientation to life was necessary to build real experience—marshaling constant attention, appreciating the subtle diversity of animal nature, and resisting boredom. She was castigating a select few of our more inexperienced coworkers who she claimed just show up for a paycheck, laboring according to the law of standard operating procedures, because "they don't really observe what's going on in that crate." She saw this act of working to a model that everyone knows is just an approximation of the world—even if sanctioned by management—as a form of abuse. "They'll just feed the animal, and they won't look if it's a skinny pig, or a lame pig, or if it's sick. There's so many ways you can look at a pig: the way she lays, the way she breathes, the color of her skin, her hair. Everything." At the same time, despite being more talkative than our other coworkers about her passions, Robin was hardly unique in her dedication to her newfound agrarian skills.

Robin's aim was to know all the types of pigs—and ailments—that can be generated by modern animal genetics. Unlike what Byron Ross implied, hers was not an irrational attachment to porcine life forms. It was a trained mode of attention that was necessary to sustain the animals she worked with, in a context where industrialization continuously re-creates what it means to be pig. "Love" was thus not a matter of naive affection for pigs but an ethical

practice of being open and attuned to new expressions of animal life. Every one of her active glances at piglets—from novel angles, tasks, or positions—added to her knowledge of porcine possibility. She was building a personal archive of the species and its traumas, an embodied and hard-earned situational sense about the specific patterns through which pigs have come to manifest in this barn.

To put it another way, Robin strove to know everything she could about the 2010 version of the Berkamp Meats confined piglet. She has never been inside the slaughterhouse to witness the death of the pigs she saved, encountered a grown hog, or even seen swine standing outside. Everyone on factory farms is specialized into one phase of the life and death cycle. Hers is not the agricultural love that is romanticized in popular culture, that of the old-time farmer who raises and sacrifices an animal from birth to death to nourish his family. It is a specific kind of industrial love that is attuned to healing every possible expression of injured piglet life. I do not know what ultimately motivated her to work in this focused and intense manner. Perhaps it was a religious sentiment of responsibility for other beings, as she once suggested, or maybe she was just the type who takes pride in labor and a job well done. Moreover, it feels too dramatic to frame Robin's everyday acts of attention and care as a matter of political resistance to the factory farm. But she never struck me as an eager participant. It seemed more as though she was trying to preserve a sense of ethics for herself despite working amid disposable life-forms; her practice of love was an attempt to directly commune with the animals in her care *in spite of* the conditions of their existence. Becoming deeply intimate with fine-grained dimensions of modern piglet bodies, paradoxically, also felt like a way of achieving a kind of distance from the broader operation's structural and affective logics of exploitation.

Or so it initially appeared. A few weeks after I started working at Berkamp Meats, Robin's attention to unique porcine difference proved necessary in a context where engineering is gradually changing pigs' bodily integrity. Her tense and uncertain practice of cultivating a kind of intimate detachment from the factory farm's routine violence came to appear as central to its very reproduction. A recently introduced line of sows had reached their second parity—their second pregnancy, which usually results in larger litters than the first one—just as we were phasing out an older experimental line with extreme hyperprolific qualities, which had yellow ear tags labeling them as MDM707s. The combined sows gave birth to more piglets, on average, than could be nursed by the species. I remember it as a frantic week of force-feeding tiny runts with plastic bottles of powdered milk formula, warming shivering animals under heat lamps, and carting wheelbarrows full of tiny

piglet corpses out to Dumpsters. I largely watched from the sidelines, as my skilled coworkers used milk crates to enact segregated feeding times. They were trying to appraise which animals looked the hardiest, when they all appeared weak and emaciated to my untrained eye. Trying to intimately "save" runts by warming them in coverall pockets was only the tip of the iceberg. As she moved across rooms, Robin would not hesitate to perform mouth-to-mouth resuscitation on near-stillborn piglets. Robin's knowledge of runted life in all its possibilities was indispensable, allowing her to identify ailments such as poorly developed leg muscle tissues. She rushed to construct elaborate body casts out of duct tape that might give these specific musculoskeletal traumas a chance to heal.

The skilled labor of Robin and other workers managed to keep the majority of the piglets alive. But this should not be read as a heartwarming story. It not only concerns saving individual pigs but also provides clues about how the runt is being sustained as an emerging porcine norm. This week of fluctuation offered an image of sows forcefully evolved to create more pigs than the animal can biologically nurture on its own, along with a systematic incapacitation of piglets through unique traumas. It offered a vision of workers who need to become prosthetics to genetically harmed pigs, as people like Robin had to use all of their knowledge and care to supplement the animals' basic vital functions that runts can no longer perform on their own. This fleeting experience of excess labor and violence haunted me long after I finished working for pork corporations. I have come to think that it foreshadowed the pig of the near future. As scientists and managers pursue a potentially infinite increase in statistical quantities of pig litters, the hidden labor of migrant farmworkers is extracted not merely to "save" individual meat animals but to maintain the industrial species' integrity amid roboprocesses.

Living in Nonstandard Worlds

Roboprocesses are scripted forms of sociality that aim to eschew situational logic in favor of a predetermined and automated calculus.[37] But we might also say that the lived effects of these scripts—including who gets to live by their standards—are not evenly shared. Robin's workplace plight allows us to notice something else: the emerging class dimensions, and even the subtle remaking of class experience, of an increasingly automated world. Some employees are tasked with the work of scripting standardized situations based on their ideas of what should be normal or necessary, while others must work on the situational exceptions that inevitably arise on the margins.[38] A simple, if perhaps flippant, comparative example is the newfangled role of the machine

attendant who monitors automated checkout lines at pharmacies. This person's primary job—and in my experience, it frequently appears to be a busy one—is to correct where the machine's predetermined scripts fail. Standardization once denoted a specific process of developing interchangeable parts and labor practices to make relatively uniform products at predictable and quicker rates.[39] It now appears to be a *way of social being* that is unequally distributed and inhabited by stratified classes in the workplace. This relation underpins the making of the modern American runt.

Navigating more-obvious roboprocesses is an everyday part of working-class labor on American factory farms. Low-level managers are hired into work sites based on quantified personality tests that purport to match ideal attitudes to the kinds of labor that take place at specific stages of birthing, raising, and killing pigs. In farrowing barns, we were instructed to record the cause of piglet death on a form that contained thirty-one distinct categories. The signs of injury on the piglet corpse never seemed to discretely fit into a single category, such as pneumonia or diarrhea. We would just mark "12: Laid-On" because sows crushing their offspring in farrowing crates was what managers claimed was the most common form of piglet death.[40] Most farrowing barn workers greeted such roboprocesses with a dismissive roll of the eyes. Everyone saw these arbitrary procedures as a matter of managers trying to perform themselves as capable managers who had such all-seeing knowledge of "the system," as they called it, that their planning process and categories can seamlessly encompass any event.

There are real consequences to these acts. A simultaneously amusing and insidious example comes from artificial insemination. Many workers knew, based on years of experience, that stimulating sows with a series of touches, presses, and tugs of the fur that were responsive to the individual animal would cause the sow to quickly draw in the semen. But managers were unable to adequately quantify these gestures and build them into standardized training programs. They insisted that we stimulate sows by merely sitting on their backs—claiming it was more "natural" since we were imitating a boar's mounting—engaging in four standardized rubbing motions, and simply waiting. The method was ineffective but put into place because it was uniform and legible to managerial planning. Days spent in artificial insemination managed to be both terribly boring and surreal, chatting and joking while sitting for hours on the backs of sows. Whenever we were in a rush, as when many pigs were in estrous, people had to hop off the sows when managers were absent and clandestinely work harder than was officially permitted. The ordeal enraged some workers because the effect of the insemination process was to pretend that their real and needed skills did not matter.

Unlike a classic instance of deskilling—such as when a machine technology is used to obviate a craftsperson's embodied and well-remunerated knowledge[41]—these procedures did little more than cloak the skills of workers. Their knowledge remained necessary to make the roboprocess appear effective in the first place. This was a matter of producing "cheap" workers by ignoring how their skills sustain roboprocesses. This is what I mean by standardization being a social way of being that is distributed unequally in the workplace: some people get to craft abstract algorithmic processes, while others are relegated to working on all of the exceptions that must be handled to maintain that system. Some dwell in abstract numerical spaces of digital benchmarking, while others inhabit disasters on farms. In a world of roboprocesses, standardization is a privileged experience. Obediently sitting on those sows, or hopping off of them when that method proved inadequate, was not about making actual pigs. It was about fulfilling managers' authoritative ideals of animality.

This, in any case, is one way of understanding Robin's story: her unrecognized skill is a result of intimate familiarity with the industrial pig. It is a means of handling the exceptional beings—which are increasingly becoming the normal expression of the pig—that are generated through the roboprocesses that remake pigs' nature. The majority of her time is expended on (literally) naturalizing others' totalizing visions of the world, for without her labor, modern runt genetics could not be sustained. Her work to recuperate the bodies of actual animals allows scientists and engineers to dwell in a standardized space of animality: abstract statistics, average output numbers, and fantasies of animal nature that presume that there is still a stable and generic thing called "the pig" in spite of the way it is being destandardized by infinite proliferation. Hers is a hidden sort of work, but it is one that props up the ambitions of an entire network of off-farm planners. Indeed, you will never read about a person like Robin in any pork science journal or trade magazine. In the rare instances when farm labor is discussed at all in the context of litter sizes, it is to suggest that farms may need a bit "more of it"—as a measurable quantity of stuff akin to an injection of antibiotics—at the point of farrowing to prevent death loss due to stillbirths.[42] But without farmworkers' knowledge, schemes to achieve infinite proliferation practiced at experimental places like USMARC would collapse. Sustaining the runting of pigs requires workers to constantly give animals their situational "love."

This is perhaps the deeper tragedy of loving the modern runt. In the introduction to this volume, Hugh Gusterson notes that an algorithmic world is one where "the common sense and situational logic of humans is displaced by and subordinated to the logic of automation and bureaucracy." What I have

been suggesting is that this subordination can also come to remake the very meaning and value of still-existing situational common sense. In this case, digital roboprocesses rely on people such as Robin to become oppressively *hypersituational:* exhaustingly attuned to minor differences and discrepancies from standard pigs and processes. The act of trying to create a standardized world of abstract procedures and pigs condemns some to its exceptions.

Years after I first met Robin, infinite proliferation has continued to act as a basic and underquestioned goal within pork industry planning and research. Yet, there are signs that it will not be sustained indefinitely. Pigs are reaching their biophysical limits. Workers are expressing more livable visions of human–animal relations. Activists and artists are developing ways to value animals that does not reduce them to economic potential and worth alone. Eaters are demanding a more ethical food system. When the *New York Times* released its exposé of the U.S. Meat Animal Research Center, the public and professional outcry was remarkably swift. Prestigious journals retracted some published articles by scientists at USMARC. People started questioning how agricultural research dollars are allocated and called for stronger animal ethics oversight. At root, however, they did not address the basic issue of democracy, technocracy, and class inequality that lies at the heart of things such as 30 P/S/Y: some people are scripting abstract animal natures, while the invisible labor of others is enlisted to sustain their creations. What remains unacknowledged is that this is not an isolated matter of animal suffering. The well-being of both individual hogs and human workers is inseparable from the broader engineered state of life into which they are born and their labor unfolds. Animal trauma is, now more than ever, inseparable from human dignity. What is most needed is not larger proportions of caring and ethical scientists on the boards of research institutes. It is that people like Robin Garcia—those whose work is embedded into, and most tangibly animates, these processes—should have a say in how we define humane agriculture in the first place.

6

Emotional Roboprocesses

ROBERT W. GEHL

Most critics of roboprocesses, including other contributors to this book, take aim at their impersonal nature. We may see such processes as cold, indifferent to the specificities of human experience, and hyperrational to the extreme, often producing absurd or Kafkaesque outcomes. When we confront roboprocesses, we tend to bristle: "I am not a number. I am not a machine. I am a human being." We believe that what makes us human cannot be discretized, a belief tied to conceptions of human uniqueness that have roots in the Romantic era, if not earlier. We believe that machines are cold, rational, and predictable, while humans are hot, emotional, unpredictable, and wily. We may concede that machines and bureaucratic processes can regulate our movements at times—they can dictate our motions on an assembly line or force us to take off our shoes and hold a pose to get through security—but we believe they can never regulate our thoughts, feelings, and desires. We insist we can love, make friends, be sad, or get angry without machinic processes dominating these practices.

However, right now, a host of data scientists, computer scientists, software engineers, human–computer interactionists, and, above all, marketers and advertisers are developing roboprocesses to control and direct emotional and relational practices, to channel their energies, and to fuse these practices with mediated messages or commodities. Moreover, these roboprocesses are not cold and hyperrational but hot and emotional—or, at the very least, they reflect our emotions back to us as we engage with them, which undermines our long-held assumption that machine processes can only be cold and unemotional.

Such emotional roboprocesses are intimately tied to who we are, what we like, or whom we're with. They emerge through a historical context that brings together disparate practices: sociality, consumption, emotional expression, marketing, identity formation, and surveillance. Rather than view emotional

roboprocesses as impersonal, bureaucratic machines, we must question the quality of their highly personal relationships to people. We must ask how emotional roboprocesses seek to capture, reflect, and even structure our inner lives and subjectivities, and what effect this structuring has on how we think and view the world, especially in our capacity as hot, emotional human beings.

Exploring the historical context of emotional roboprocesses allows us to determine how capitalist forces began to view the inner energies and colors of emotion as resources to manage. Taking emotional reaction to media messages as a central variable lets us consider how these observation practices have morphed into practices meant to digitally capture human activity, including emotional and social activities, and encode these activities into machines. Eventually, such machines will automatically supply us with emotional reactions to the world, or at least reflect and respond to our reactions. As I will suggest, emotional roboprocesses have a telos; their goal is to smooth out the rough edges of our anxious lives, channeling our emotions toward consumable objects and ideas. Above all, the machines will appear to understand human emotion, and they will encourage us to love them—and those who control them.

Consumer Capitalism

The key historical context of emotional roboprocesses is consumer capitalism. As I write in fall 2017, news outlets are tweeting anxious headlines about the latest #BlackFriday and #CyberMonday sales figures. Why the stress over a few days' worth of Christmas shopping? Because much of our economy hangs on whether we buy more this year than last.

But there's more to this stress over consumption than simple sales figures. Our very identities are at stake. Since the early twentieth century, the material fruits of industrial capitalism—cars, appliances, clothes, media systems, food, vacations, experiences, and so on—have been so abundant and heterogeneous as to allow us to form and express social and psychological selves through our purchases. In lieu of other ways of making ourselves within and through communities (for example, religion, citizenship, or education), capitalist forces ask us to become who we are predominantly through the medium of consumption. Buying has become a sort of freedom that allows one to announce to others one's identity, prowess, emotions, and values. And during seasons such as Christmastime, the gifts we pull from store shelves mediate our social ties. Consumption and emotion have become intimately tied together.

Consumer capitalism is hot, intense, and directly dedicated to the management of human emotion. Borrowing Eva Illouz's definition of emotion as the "inner energy that propels us toward an act," the thing that "gives a

particular 'mood' or 'coloration' to an act,"[1] we can think of capitalism as a system that directs flows of emotional energy just as it directs flows of wealth and material. And if we consider how emotions "color" actions, we can start to think about the ways in which rational consumer choices can take on the coloration of emotional fulfillment. Consumer capitalism has turned toward the management of feelings and social relations as they pertain to consumer choices. In the United States, for example, the advent of an affluent middle class spurred the rise of an industry devoted to directing that class's consumption patterns. I'm speaking, of course, of the marketing and advertising industry, the "Captains of Consciousness," as Stuart Ewen famously called them in 1976.[2] From the 1940s onward, as the disposable income of American industrial workers rose—thanks in large part to trade unions and the accidents of global history—so too did the profits of the "Mad Men" of Madison Avenue advertising firms, who developed sophisticated techniques of persuasion and market research to help consumers emotionally express themselves through cereal, cigarettes, cars, clothes, shoes, and liquor. If the great sociologists of modernity were correct to point to anxiety and a blasé attitude as the key modern emotional colors, the great marketers of America had the answer: Allay your anxiety with a Coke. Overcome your alienation with a Cadillac. Build your social bonds with a vacation to Hawaii.

The marketing industry is in large part an industry of emotional management. I use the word *management* purposefully. Think of your choices in the grocery aisle: Who manages them? You might say you do, but if I say, "They're *G-r-r-r-eat!*" and you automatically think about Tony the Tiger and Kellogg's Frosted Flakes, you would see that decades of marketing and advertising have subtly shaped your choices. Advertising messages, repeated ad nauseam, are key technologies meant to manage our consciousness and direct our emotional energies to objects in specific ways. But advertising is merely a reflection of the larger economic need to manage, intensify, and extend consumption in all walks of life.

This consumer-oriented, emotional management logic has been folded back onto the world of work as well (a point Illouz makes consistently through *Cold Intimacies*). Those in retail—who operate as frontline, customer-management workers—have been the target of emotional management as intense as the scientific management to which their brothers and sisters working in manufacturing were subjected. In 1983, Arlie Hochschild detailed how flight attendants manage their emotions in her famous book *The Managed Heart*.[3] Since then, entire fields of management science—broadly called "knowledge management"—have targeted frontline service workers such as help desk, sales, and retail staff, hoping to make their emotional and cognitive work practices more efficient and profitable.

Corporations associate and intensely manage our actions (*Which cereal should I buy?*), thoughts (*What was the name of that movie I wanted to watch? What should I include in this report?*), and, above all, emotions (*This truck makes me feel like a man! Smile while you're talking to the customer on the phone! Jennifer will love this shirt!*). This sort of management is ubiquitous and all-pervasive: work and home life blur, production and consumption meld as the same techniques that guide our inner energies toward the right brand in the store also guide our minds as we talk to customers at the office. It is a system dedicated to producing a subject who behaves in relation to intense inner energies that constantly demand release, expression, or satisfaction and sees consumption as the smoothest path toward this fulfillment.

For our purposes, then, consumer capitalism is a fundamental substrate that sets the conditions in which emotional roboprocesses can emerge. Here, the emotional and the social are viewed through the lens of consumption and thus seen as economic. As such, wherever they appear, they must be managed and put to work along particular paths, guiding our hands and hearts to ensure the continued profits of the producers of consumer goods. To better manage, direct, and intensify this socio-emotional-economic activity, marketers and advertisers have developed a host of new media technologies to observe, capture, replicate, and direct the actions of human consumers.

Observing the Relationship between Media and Emotion

Media technologies have been central to consumer capitalism, and the genres of media entertainment are deeply rooted in emotion: horror, drama, tragedy, and comedy. Advertisers have recognized that placing product advertisements alongside emotional content of specific films and television shows can increase their effectiveness. But to make advertising all the more effective and to improve the articulation of emotions, consumption, and sociality, the marketing and advertising industries are spending a great deal of time observing how people and media technologies interact.

Nielsen ratings, consumer ethnography, and psychological and social profiling have been around since the mid-twentieth century, but our current internet-based observation technologies originated in the popularization of the internet in the 1990s. The transfer of the internet from government and military control to commercial enterprises marked an intensification of the observation of human–media interaction, and the advertising industry almost immediately organized and standardized tracking technologies. Given the industry's role in managing consumer activities, and given the recognition in the 1990s that the internet would become the dominant media system

of the future, marketers and advertisers were in a prime position to lead the development of observational techniques. The growth of online advertising trade consortia, such as the Digital Advertising Alliance, the Interactive Advertising Bureau, and the Mobile Marketing Alliance, is a direct result of the rise of the internet as the space of observed consumer–media interaction.

The key innovation here is the creation of contained systems in which humans are meant to operate and be observed. Whereas websites appear to be fragmented and diffuse, ties bind them, including advertising networks that link multiple sites. Media consolidation also creates contained spaces—one can browse a whole host of seemingly distinct websites, apps, and media channels all owned by single companies (Google, Amazon, Microsoft, Viacom, Apple, and so on). Within this contained system, a host of technologies do observational work. Web cookies are probably the most famous; these small text files are deposited on web browsers (such as Firefox or Chrome) as users move from site to site. These files often contain unique identification (ID) numbers, and correlating these ID numbers to server logs lets an observer track a user's web habits. Contemporary mobile browsers use specific IDs tied to the devices themselves (for example, Apple's IDFA and Google's Advertising ID) that track mobile phone users and are harder than cookies for end users to remove. Finally, media companies now regularly require us to log in to view content, anchoring our media habits in a specific user account.

Though this system of observation is relatively contained, it offers a sophisticated window into people's media habits. Here is where the articulation between capitalism and emotions becomes most evident. Some media messages resonate more than others—that is, people view, download, buy, or talk about these messages more than others—and tracking technologies "observe" who downloaded or viewed what message. Techniques such as "sentiment analysis"—essentially big data analysis of the emotional content of social media messages—provides more data about the emotional state of media viewers. Given that media messages convey encoded emotions, this observation provides a wealth of data about viewers' emotional states, and that data can in turn inform advertisers about potential emotion–product articulations. As marketing scholar Stephen Brown notes, marketers have thus used observation techniques to understand "the deeply-felt beliefs, emotions and meanings that inhere in the rituals, myths, and symbols of consumption behavior."[4] The stakes are high: placing an ad in the wrong emotional context can undermine its message. Indeed, as advertising executive Nick Welch argues, "The impact of any ad can be diluted if placed in an irrelevant context or if the emotions elicited by the content contradict the message of the ad. Twitter-based research proves viewers who have an emotional reaction to a TV show are more likely to

remember its commercials than those who do not. This trend is even more significant with digital advertising as—with such a diversity of online inventory available—ads can easily end up next to irrelevant or questionable content."[5]

Indeed, conflicts between advertisers and YouTube have erupted, showing the stakes of emotional mismatches.[6] Marketers, then, must know the emotional content of media objects, the emotional states of media consumers, and the reaction these things might have with particular advertising messages (themselves carriers of emotion) before seeking to channel our inner energies. Hence, the massive surveillance machinery they deploy to monitor consumer sentiment in and through digital media. Moreover, such observation sets the stage for new technologies designed to *capture*—not simply observe—the practices of human–media technology interaction within the context of contemporary capitalism.

Capturing and Encoding Human Emotion

Observational technologies and capture technologies have historically been distinct. For example, I could observe you walking down the street without capturing your motions, and, by paying attention to your posture, facial expressions, and gestures, I could speculate on your emotions. I could judge you by what you look at and what you buy and observe the apparent differences in your emotions before and after your purchases. But I would have a far harder time capturing these details. I could film you, take notes, or write about you in a novel, but these techniques are time-consuming and subjective. However, thanks to the digital technologies that have emerged within consumer capitalism, far more advanced systems now fuse observational and capture functions, quickly and efficiently encoding human action, thought, and emotion into digital records.

For example, the integration of nearly ubiquitous cell phone use and geographic information systems (GIS) means that our locations and movements through space are now not simply observed but captured. Location-aware smartphone applications such as Foursquare, Swarm, and Uber promise to augment our perception of our surroundings by offering local search, social networking, and transportation based on our location. To function, they require the constant capturing of where we are and what we're doing in space and time: where we eat, where we socialize, whom we're with, where we live, and how we move from one location to another. The social, spatial, emotional, and temporal become fused.

Location-aware systems, however, are somewhat limited, being based solely on the location of our phones. More powerfully, what our eyes see can now be captured. Although it is no longer offered, Google's Glass technology

functioned as a prototype, demonstrating the ways in which our location information could be combined with data about what we're looking at. Okulus is a virtual reality headset marketed to gamers and now owned by Facebook. Facebook founder and CEO Mark Zuckerberg has envisioned a Facebook-Okulus pairing as a system by which we could attend meetings and sporting events in addition to playing virtual reality games. As with Glass, these interactions would be not only about making things visible for us but also capturing how we look at the virtual and actual worlds and people around us. Where do our eyes linger? With whom are we socializing? How might our vision articulate with other emotional indicators, such as tone of voice?

We are of course more than eyes and locations. Motion-capture technologies promise to capture our physical motions. Various technologies already do so, from multiple high-definition cameras to inertial sensors and cybernetic suits that track limb and joint movements. These technologies are used in movie production, military simulations, and worker training. Today much attention is being paid to high-definition capture of human facial expressions, a process called "performance capture," which has allowed computer animators the ability to re-create human emotional performances in animated characters such as Gollum in *The Lord of the Rings* and *The Hobbit*. Until the 2010s, these motion-capture technologies did not appear in everyday consumer settings, but the mass production of video game systems such as the Wii, X-Box (with Kinect), and Playstation (with the EyeToy, Eye, and Move) have brought about the possibility of performance capture (read: human facial emotional capture) in living rooms around the world.[7]

Underpinning all these advanced capture technologies is a now passé and yet highly significant capturing system: contemporary social media. Within sites such as Facebook, Google+, LinkedIn, Twitter, and Pinterest, we declare who our friends and contacts are. We "like," retweet, and "+1" objects we encounter across the internet, expressing how we emotionally color the people and things around us. We make declarations about what we're doing, whom we're with, and what we're feeling. Indeed, as I've argued elsewhere, Facebook uses the term *like* because marketing theories of emotion equate "liking" with strong affection for a brand, person, or object.[8] In 2016, Facebook allowed users to express more moods via emoji, including happy, sad, angry, and surprised. Now your emojied response can go beyond "like" if you want to intensify its emotional resonance and "love" a posting.[9] Behind the interfaces, databases collect every action we perform within these social media sites and track how these emotional signals relate to site activities such as clicking on pictures, profiles, and advertisements. Contemporary corporations build social media sites explicitly to map what Zuckerberg has called the "social graph" of our

connections, including our social connections to one another and our emotional connections to consumer goods, brands, media objects, and the like.[10]

Taken individually, any of these data points may not reveal much of our emotional states, but taken as a whole, they reveal a great deal. The key analytic move used by marketers is to crunch all these data points. Massive server farms store all these captured data, both commonly tracked items, such as our movements in space and our social graphs, and emergent data points, such as our eye movements and facial expressions. Although capture technologies tend to generate a tremendous amount of poorly structured data, technology companies are refining new techniques for managing and analyzing these big data. For example, the software package Hadoop aims to manage and analyze the big data that capture technologies produce. With a system like Hadoop and the right data, one could fold together location information, motion information, and social connections to produce a detailed, dynamic profile of human emotional states. With new algorithms from companies such as Kairos, facial expressions can be mined for their emotional contents.[11] It bears repeating, however, that the larger context that inflects this profile—namely, consumer capitalism—is concerned with the matrix of emotion, behavior, and purchase decisions. Corporations capture location, vision, movement, and sociality to create one ideal profile: that of the consumer.

The New Emotional Machines

Capturing human actions, emotions, and thoughts in a digital format can enable new machines to replace human practices, including decision making based on our emotional states. Consumption can be thought of as a rational process, yet it is also irrefutably emotional. We ask not only, "Which product will satisfy my needs?" but also, "Which product will make me happy?" and "What product will bring my family together?" Consequently, consumer capitalism increasingly enrolls emotions into its machinery, and many emergent emotional roboprocesses are tied to consumer decisions.

For example, after commerce shifted to the internet and companies started tracking, capturing, and analyzing patterns of production, distribution, and consumption, software engineers produced recommendation engines that use algorithms to suggest to consumers what else they might buy. Amazon's book recommendations, Google's search results, and Netflix's video suggestions are the most famous of these algorithms. As is well known, they are based on crowdsourcing the decisions of previous consumers—people who watched *Black Mirror* also tended to watch *Mr. Robot*. These systems have generally used genre or other large categorizations in their sorting of

media objects. However, cutting-edge research seeks to integrate emotional cues into these engines. A survey of computer science research into integrating "affective computing" into recommendation engines notes that advances in emotion detection techniques "paved the way for the exploitation of emotions and personality as descriptors that account for a larger part of variance in user preferences than the generic descriptors (e.g., genre) used so far."[12]

In other words, traditional descriptors such as "comedy" or "drama" in systems such as Google, Netflix, and Amazon may give way to recommendations based on emotions. ("Emotional Independent Dramas for Hopeless Romantics" is already a Netflix category.[13]) This development would give any recommendation engine even more powerful means to shape our futures—where we click, what we read, and what we watch—by exploiting emotional data captured from users. Not surprisingly, developers of dating and hookup apps are keen on integrating these engines into their systems. Previously, those systems worked with demographic categories: age, sex, location, occupation. In the new paradigm of emotion-based recommendation, machines capture the hot emotional practices of love and sex, and new users receive dating or hookup recommendations based on other users' practices, further intensifying their engagement with each other and, not incidentally, with these systems.

In a related development, a class of robot called the *socialbot* has come to social media. Socialbots are automated profiles in Twitter and Facebook that are built to appear to be human and that can automatically shape human interactions.[14] If they are built well, it's difficult to tell them apart from actual human profiles. Socialbots are possible because of social big data—records of our interactions within Twitter and Facebook, including who our friends are, places we like to visit, and the evolution of our emotional state over time (as measured by our use of emojis or by sentiment analysis of the content we post). By analyzing these interactions, socialbot developers can make automated profiles that can mimic human activity so successfully that humans befriend them and carry on conversations with them. Socialbots can be built for relatively benign purposes, including computer science research into human–computer interaction. However, as the 2016 U.S. presidential election revealed, socialbots can also create the illusion of consensus around various political issues or promote a brand or politician in a highly interactive manner. At the very least, such bots can subtly shape online interactions, linking people who might not otherwise connect.

In addition to emotional roboprocesses associated with media consumption, leisure, and socializing, we're seeing emotional automation in the world of work. Many of us have dealt with automated phone systems—it's often a frustrating experience. Software engineers have used records of such

interactions to map our emotional states at various points in the process. Based on this capture, they are developing new generations of automated phone agents that can classify human emotions in real time and respond accordingly (and, we would hope, soothingly). Similarly, business theorists have been thinking about the automation of in-person retail for years. A notable example is Sandeep Krishnamurthy's imagined "Automated Wal-Mart," a megastore that requires no human retail agents and that can help shoppers through artificial intelligence.[15] Pepper, a frankly adorable robot "powered by love" who can work in retail sales, is materializing Krishnamurthy's thought experiment in Japan.[16] Amazon is also experimenting with the idea in a brick-and-mortar Amazon Go store in Seattle.[17]

Hence, previous capture technologies are enabling media consumption, socializing, customer service, and shopping to be automated, and a key concept that drives these innovations is emotion. Recommendation engines work by capturing and categorizing consumption patterns, including rationalized data sets that computer scientists argue indicate emotional states. Socialbots are only possible after social media capture enough patterns of social interaction through likes, friends, and emojis. Automated customer service relies on the recording of previous interactions—including angry and happy experiences—and their standardization and codification into software processes. Retail robots function within a highly specified environment (chain stores with standardized aisles and consumer goods) and will likely benefit from the intense monitoring of consumer activity within that space (via loyalty cards, smartphone tracking, and cameras) as well as age-old sales techniques that emphasize emotion. In sum, digitization of human activities gives rise to robotization of human activities, and these latest robotizations are meant to direct emotional energies toward the ends of those who control them.

Emotional roboprocesses thus are designed to shape what we read and think about and with whom we associate. As Brad Meehan argues in *Advertising Age*, "Consumers now live in an online world where the content they see is orchestrated and controlled by marketers and big-data algorithms that decide which products they need, which news articles to read, and which friends they should see in their Facebook news feeds."[18] This last point is worth emphasizing. Using algorithms to select whom we ought to associate with is not innocent; marketers have long recognized that certain people within social networks are "influencers" who can shape the consumption patterns of those around them. The appearance of Bob rather than Alice within your social media timeline might be less a function of Bob's relevance to your life and more a function of a marketer's wishes that Bob—and the emotions Bob may excite in you—might remind you of some product you ought to buy.

We are increasingly bound to a landscape where a flat, distributed network graphs brands, friends, stores, colleagues, media objects, political parties, homes, restaurants, families, corporations, and lovers, where algorithms alone dictate our access to parts of that network, and where the ways we're invited to navigate this network are proposed in relation to our emotional states. Zuckerberg's social graph assumes that a brand, say McDonald's, is just as worthy of your friendship and affection as your mother is. The social graph also assumes you'd prefer to hang out with Bob instead of Alice. And given that these emotional roboprocesses are extensive, nearly instantaneous, and opaque, it is difficult to see how we can continue to claim that human emotion is the essential differentiator between us and machines.

The Dangers of Emotional Roboprocesses

Where might emotional roboprocesses lead us? I see three possibilities:

- bizarre outcomes that utterly fail; or
- a hollowing out of human emotional life; or
- lives full of love.

BIZARRE OUTCOMES

I have suggested that the telos of emotional roboprocesses is the smoothing out of the rough edges of daily life, channeling our emotions neatly so that we find the right product, friend, lover, or idea to satisfy us. However, given the complexity of mapping and shaping emotions, there is no doubt that some outcomes of these processes will be strange. Take the 2012 *New York Times* story that reported the case of Nick Bergus of Iowa City. On Valentine's Day, he came across a product listing on Amazon for a fifty-five-gallon drum of personal lubricant. As the *Times* article reports,

> he found it irresistibly funny and, as one does in this age of instant sharing, he posted the link on Facebook, adding a comment: "For Valentine's Day. And every day. For the rest of your life."
>
> Unfortunately for him, within days, friends of Mr. Bergus started seeing his post among the ads on Facebook pages, with his name and smiling mug shot. Facebook—or rather, one of its algorithms—had seen his post as an endorsement and transformed it into an advertisement, paid for by Amazon.[19]

Bergus had become a victim of poorly tuned emotional roboprocesses. His emotional reaction to the fifty-five-gallon drum of personal lubricant—humor

and sarcasm—was misinterpreted as it was mediated by Facebook's Like button. The Like button, as many critics have pointed out, is an incredibly reductive signal of emotion. In the absence of other signals—"Humor," "Disgust," "Sarcasm," or "Dislike," perhaps—Bergus had to signal his reaction with Like. Facebook (and Amazon) automatically interpreted his Like as an affectionate endorsement for that product.[20]

Emotional roboprocesses can thus have absurd outcomes, implying that their machinery is anything but smooth. It is possible, then, that we wily humans will escape from their attempts to map themselves onto our inner energies because our emotional states will remain too complex for the machines to fully analyze.

HOLLOWING OUT OF HUMAN EMOTION

Or, the very idea that emotional roboprocesses may come to direct every emotion-colored act we engage in could cause some people to become alarmed that human emotion will be fully abstracted from humans and will become the sole property of machines. If it comes to the point that every act we engage in will be algorithmically managed, are we humans feeling emotions anymore? Or are the machines feeling them for us and making recommendations accordingly? In other words, if the energies that propel us toward acts and give those acts mood or coloration are no longer coming from inside us but are instead produced by software processes, could we claim to be emotional? In such a future, human emotion would be eradicated as a means for living social, political, or economic lives. A scenario wherein machines are hot and emotional and humans merely react to their dictates is another disturbing outcome, one that's not quite as funny as Bergus and the fifty-five-gallon drum of personal lubricant.

LIVES FULL OF LOVE

However, I do not think either scenario—absurd outcomes or the complete hollowing out of human emotional life—is in our future. Instead, I think that we will come to love emotional roboprocesses as they are increasingly fused with our daily lives. They will not supplant our emotional capacities but cybernetically supplement them, always with the larger goal of subtly modulating our inner energies in particular directions.

Bergus's story is an extreme example of a more common complaint: that the advertising we see online is slightly off, that the sales pitches that we receive are not quite persuasive, or that the friends Facebook suggests or the lovers Tinder suggests don't quite sync up with who we are. However, what is notable is not

so much the weirdness of mistaking sarcasm for affection for a fifty-five-gallon drum of personal lubricant; rather, there is a curious, common reaction I've observed over the years among people who hear stories like these. If people have a problem with emotional roboprocesses, frequently it is because the processes are imprecise, that they failed to make the right recommendation at the right time. Complaints about lack of precision in emotional roboprocesses contains an implicit critique: "After all my Rewards Card shopping, Facebook liking, Amazon rating, Twitter jokes, Tinder swipes, and Netflix queuing—after all that observation and feedback—*don't they know who I am? Don't they know what I love?*"

I would suggest that this reaction reflects a long-standing, deeply ingrained desire that emotional roboprocesses improve and intensify how our emotions are mapped and managed. If we encounter an ad for something we don't like, if the dating app suggests the wrong type of lover, or if the recommendation engine suggests a scary television show instead of an uplifting one, we demand better results that reflect who we really are. Again, to return to the Romantic's protest, we are not numbers. We are each of us unique, and we demand that consumer capitalism bend its offerings to our emotions and desires.

Ultimately, this demand is actually for more, and improved, emotional observation, capture, and control technologies. In other words, we react by saying, "Let's make the system smoother." We demand that emotional roboprocesses *get to know us better*, that they improve the quality of their emotional and social connection to us. We want Siri to anticipate our desires, Google to better understand our search terms, Facebook to suggest better and more relevant stories and friends. This reaction, I would argue, is conditioned by the fundamental substrate of emotional roboprocesses, consumer capitalism, which holds out the promise that all our inner desires ought to be fulfilled by the world of consumer goods.

Thus, we actively call for improving emotional roboprocesses to the point where they understand the complexities of human emotional life. Indeed, the computer and data scientists working on integrating emotion into machinic processes hear this call, and they are constantly working to improve the granularity and precision of their systems by both improving their capture techniques and improving how emotional machines are implemented. The rewards for this are great: Facebook, Google, and Amazon are hiring data scientists left and right, and paying well for them. This is why I do not believe emotional roboprocesses will have predominantly absurd outcomes in our future: there are too many smart people trying to make our emotional roboprocesses smooth and precise.

It is also why I do not believe in the second possible scenario, that emotional roboprocesses will totally abstract emotion from humans. I would

argue instead that emotional roboprocesses will always require us humans to feel emotion. Social media, recommendation engines, automated phone systems, or interactive media require human emotion to function and always will—our cultural and emotional evolution as a species will always be the motor that drives these systems. As tastes, fashions, and feelings evolve, so too must emotional roboprocesses evolve alongside them. Human emotion and digitization will always be overdetermined.

Instead, I see a future full of love. Emotional roboprocesses can make our lives easier by smoothing out the rough messiness of emotional life. Emotional roboprocess can confirm our tastes, help us choose mates, help us find our friends for a bit of shopping therapy or time in the pub. They can help us parse political choices, choose where to live, and help us learn about the world around us through news stories we like. They will give us more and more pleasures as we connect with one another, give gifts to one another, live with others who have been selected as emotionally compatible with us. The reciprocal relationship between them and our abilities to express ourselves will continually produce new apps, new recommendations, new ideas. We will live very full lives with emotional roboprocesses. We will fall more and more deeply in love with emotional roboprocesses, and they will love us back.

And this is why I am troubled. I am concerned that these systems will be built to understand negative and dangerous emotions—fear, disgust, anxiety, hate, and anger—and use their subtle, smooth, deeply penetrating operations to offer ways to overcome those negative emotions with the right object, choice, or companionship. For example, do you feel economic anxiety? Are you concerned that some group—say, immigrants, or "globalists"—is to blame for the state of things? Here is a political party to embrace, one that will address your concerns by removing those others and their ideas from your life. All it asks is your love.

I am concerned that the inner energy that these processes call forth comes only in the color of love. Above all, I am concerned that emotional roboprocesses made through rating and recommending lovers, brands, friends, tourist traps, families, politicians, news sources, and cinematic blockbusters will be used to ensure that we love not just one another, nor just the objects we consume, nor just the processes, but also those in power, and that the energies of this love are directed up.

After all, emotional roboprocesses are not being developed in a distributed or socialized manner, but in the centralized, exploitative system of capitalism that is inherently concerned with ensuring the common wealth flows to the few and not the many. Those who have the wealth to shape emotional roboprocesses have subtle, modulatory power over many people's lives. Combine

this system with increasingly mediated and emotional political elections and we can see how a smooth future, where love is doled out or demanded according to algorithmic taste, becomes one in which emotions are constantly being fulfilled while nothing fundamental changes. This is not a world of total domination—I don't believe that's possible if emotion is the thing being targeted—but rather one of perturbations and provocations meant to excite our desires and promise their fulfillment. Those who understand how such modulations work will be in power, and we will love them for it.

Ultimately, because these processes will continue to understand human emotion, they will be woven into the fabric of human life until all things brought to our attention are liked, rated five stars, swiped right, voted for, or smiled over. Of all the roboprocesses, emotional ones threaten to be most fully absorbed into our lives, and it will be exceedingly difficult to shake free of them and shift back to a rougher world of uncertainty, doubt, or dissent.

Surveillance

7

Ubiquitous Surveillance

JOSEPH MASCO

> The Hello Barbie doll can interact uniquely with each child by holding a conversation, playing games, sharing stories and even telling jokes! It's a whole new way to interact with Barbie. She's ready to discuss anything in an outfit that blends trendy and techie for a cool look.
>
> MATTEL ADVERTISING FOR *HELLO BARBIE*

The Hello Barbie doll uses Wi-Fi and speech recognition technology to allow kids to interact with more than eight thousand lines of recorded conversation. Parents were no doubt surprised to learn that Hello Barbie could also easily be hacked and made into a covert surveillance device, turning their child's toy into a world-class spying instrument.[1] For more than a few observers, the worries about who was listening through Barbie's trendy and techie ears, however, was soon replaced by fears of surveillance by their new Samsung "smart" television. The 2015 Samsung Smart TV was revealed not only to be collecting detailed information about viewer habits but also to possess a switched-on microphone intercepting household conversations.[2] What kind of dialogue, or covert competition, might the Hello Barbie and Samsung TV be having across these "smart" domestic spaces and for whose benefit? How many rooms of one's residence or work space now contain similarly networked and automated spying technologies? And how did digital surveillance become so pervasive that everyday household items now constitute competing vectors for covert listening and always-on data collection?

The dangers of networked smart machines—automated and always on—extend well beyond the living room. Consider the whistle-blowing revelations of National Security Agency contractor Edward Snowden, who documented that everyday communication technologies from routers to smartphones to computers were being used by the security state to spy on their owners.

Add to these revelations the fears of technology entrepreneur Elon Musk, who now calls automated artificial intelligence humanity's "biggest existential threat," or the agitation of former Secretary of Labor Robert Reich over the projected negative effects of robotics on the U.S. labor force.[3] And place these warnings alongside the worries of financial reporter Michael Lewis, who has detailed the potentially disastrous global effects of microsecond automated stock market trading.[4] Each of these public figures has sounded the alarm about the dangers of networked, automated smart machines, seeing mounting dangers across the domains of national security, information technologies, employment, and financial markets. Thus, if you have a new TV or Barbie, use a computer or a smartphone, or happen to have a job or invest in the stock market—your world has recently changed in ways that are only beginning to be collectively acknowledged, let alone managed and policed.

In part, this lack of oversight is because the political and cultural implications of the digital revolution are multiple and inherently difficult to assess: new systems and capacities emerge constantly and interact in both visible and highly distributed ways, remaking world, society, and identity through increasingly automated processes. The hope behind each new information technology is that it will make the world more orderly, safe, and profitable, but quite often these networked systems create entirely new kinds of problems that reside exactly in the temporal gap between the speed of technological innovation and the slowness of regulatory governance. A striking aspect of our age is that radical (even world historical) infrastructural changes in everyday life are now achieved with a remarkable quietude in the social, political, and legal arenas, raising fundamental questions about the interactions of statecraft, commerce, technology, and citizenship. For example, on August 24, 2015, one billion people logged on to Facebook, a company only founded in 2004. In other words, one in seven people on the planet were coordinated on that new day through a digital technology that barely existed a decade earlier. In announcing this milestone, Facebook founder and CEO Mark Zuckerberg wrote in a Facebook post, "A more open and connected word is a better world. It brings stronger relationships with those you love, a stronger economy with more opportunities, and a stronger society that reflects all our values."[5] Put another way, on August 24, Facebook computers knew exactly where one billion people were located, what they were reading, and with whom they were interacting—an astonishingly powerful surveillance capability that comes in the form of "free" software. This fusion of commerce and surveillance in Facebook, a company that makes its money selling advertising via data analytics of user accounts, is but one illustration of the radical remaking of everyday life through the increasingly automated digital processes

known as social media. Facebook is an unprecedented robotechnology: it creates a two-way node of access, connecting users to people, things, and ideas as well as opening those same users to a vast array of targeted and propagandistic engagements.

American society in the early twenty-first century has normalized technological revolution in digital realms to an astonishing degree. Information technology (from social media to robosurveillance) are remaking everyday life, creating a social order that may be gridlocked at the formal political level but that is also open to constant shifts in commercial information technologies. Consumers now expect continual advances in digital machines and software, absorbing and anticipating new capacities without the requisite political or legal attention to the shifting logics of war, finance, and citizenship that are both informing and driving these evolutionary forms. In their 2013 manifesto *The New Digital Age*, Google (now Alphabet) CEO Eric Schmidt and Google Ideas (now Jigsaw) director Jared Cohen neatly sum up the scope of the twenty-first century digital transformation while also anticipating an ever-emerging and constantly accelerating digital universe:

> In the first decade of the twenty-first century the number of people connected to the Internet worldwide increased from 350 million to more than 2 billion (it is now over 2.4 billion). In the same period, the number of mobile-phone subscribers rose from 750 million to well over 5 billion (it is now over 6 billion). Adoption of these technologies is spreading to the farthest reaches of the planet and, in some parts of the world, at an accelerating rate. By 2025, the majority of the world's population will, in one generation, have gone from having virtually no access to unfiltered information to accessing all of the world's information through a device that fits in the palm of the hand. If the current pace of technological innovation is maintained, most of the projected eight billion people on Earth will be online.[6]

In Google's monopolistic vision, every person on earth is now projected to be a consumer of emerging information technologies, allowing corporate expectations of a near-perfect capture of the human population by 2025. To be sure, a wired individual today has unprecedented capacity for engaging books, films, news, and government information, as well as instantaneous communication within anyone on the planet similarly logged in. However, the remaking (perhaps elimination) of the public–private divide, the exponential growth in surveillance capacities across corporate and security interests, and the increasing capture of social life by digital technologies (across familial, activist, and consumer activities) is transforming the basic assumptions, infrastructures, and capacities of a democratic society. What is an informed voter in a world

where news has been flattened into competing digital propaganda campaigns? How are racism, sexism, and xenophobia amplified by social media platforms which channel viewers (via overt and covert process) into siloed ideological domains? Here, the smart city, the smart bomb, and the drone join social media and the quantifiable self (recording daily health metrics) to produce vast new information domains. These global infrastructures of data are gaining both historical depth and population reach, creating new, and increasingly precise, social types designed for 24/7 targeting. The digital revolution that was fomented with promises of a more informed and engaged public, is enabling a collective future that increasingly naturalizes corporate and military power via competing crypto-, psyops-, and roboprocesses working at both the granular level of the individual user and on the scale of the collective population. These trends are both in use and highly anticipatory: competing corporate and state projects assume that big data sets on human activity of any kind will ultimately become valuable and the basis for future social engineering.

The personal computer and, above all, the smartphone are commercial interfaces that expose users as much as render information to them, allowing data analytics to track and record physical location, communication networks, and consumer desires, and engage thoughts and fantasies with new precision and stealth. Seeking predictive assessments of human behaviors, data analytics now informs targeted advertising as well as security preemptions and global remote-controlled killing. As a consequence, the infrastructures and expectations of privacy are radically changing due to the merging power of robosurveillance, data analytics, artificial intelligence, and the increasingly long-term storage of digital interactions. Indeed, a vital new set of questions is emerging concerning how today's digital activities, archived potentially forever, will affect individuals decades into the future. As Mayer-Schonberger and Cukier observe:

> Google processes more than 24 petabytes of data per day, a volume that is thousands of times the quantity of all printed material in the U.S. Library of Congress. Facebook, a company that didn't exist a decade ago, gets more than 10 million new photos uploaded every hour. Facebook members click a "like" button or leave a comment nearly three billion times per day creating a digital trail that the company can mine to learn about user's preferences. Meanwhile, the 800 million monthly users of Google's YouTube service upload over an hour of video every second. The number of messages on Twitter grows at around 300 percent a year and by 2012 had exceeded 400 million tweets a day.[7]

These impressive numbers constitute a new digital economy but also an unreflexive and highly reactive society, as users (not citizens) become the basis

for a digital arms race among big data analytic companies. Efforts are under way to automate image identification—for example, to roboidentify every person in the 350 million photographs uploaded to Facebook each day—as well as to locate the patterns of reading, linking, and expression that constitute life on and across each social media platform (YouTube, Twitter, Snapchat, Instagram, etc.). The bulk of these data consists of the seemingly irrelevant traces of transitory interests and mundane daily activities, which only become potentially useful when approached through pattern recognition for very large populations (currently scaled to the millions or even billions of users). Facial recognition programs also currently struggle to see all racial and ethnic types equally, underscoring the power of algorithms to decide who is visible and tracked, and who is not.[8]

Data mining on a mass population scale redefines what an individual social identity is (in the past, present, and increasingly, the future as well) and is enabled by a continual exponential expansion of the surveillance capacity of corporate and security infrastructures. This is a digital revolution affecting billions of people around the world but one that has no master plan except the corporate pursuit of monopolistic profits and the state's pursuit of "security" in the age of counterterror. The very infrastructures of the information society—the digital platforms for communication, scholarship, art, politics, medicine, and entertainment—are simultaneously the infrastructures of surveillance, generating deep time, approaching planetary scale, data sets.

The consumer interface, remade through this constant technological revolution, opens up both the individual and the population to new modes of scrutiny and mobilization. The speed of these technological changes is a vital part of their social power, as technical capacities continue to emerge, remaking the informational economy landscape well before consumer understandings or reasonable governance can respond.

Life in the twenty-first century is, in other words, increasingly organized by and through ubiquitous surveillance. Daily activities of every kind are subject to multiple forms of digital capture, storage, and analysis, generating new tools and capacities for corporate, security state, public health, and social activist agendas. While the impulses behind identifying consumers and "dangerous" persons (marked via class and race) are as old as the nation-state form, the scale, historical depth, and synchronicities across data sets are a new phenomenon. Automatic collection and algorithmic assessment of big data generate new areas of power that can exist outside any specific human intervention while promising predictive capabilities.[9] Thus, while older surveillance systems sought to understand subjects in their past and present condition, the new world of ubiquitous surveillance attempts to capture

future selves and to intervene in their production as an ongoing process. As these technologies and logics gain momentum and scale, entirely new subject positions are being created and with them a new kind of society, one marked by the anticipations, interventions, and preemptions enabled by the linked revolutions in automated surveillance and big data analytics. Complex forms of pattern recognition increasingly not only identify but also forecast individuals as consumers, terrorists, commuters, health-minded subjects, criminals, voters, and so on.

Ubiquitous surveillance blurs distinctions between war and peace, intelligence and commerce, as well as public and private to an unprecedented degree. It also assumes that a full integration of data collection and data mining into everyday life is ultimately possible, encouraging the transformation of everyday objects, public spaces, expert encounters of every kind (medical, financial, communications), transportation systems, and commerce into connectible modes of surveillance. Tracking, observing, and screening, in other words, are becoming the basic tools of social institutions, making the individual less a citizen-subject than an informational node in an ever-emerging system of automated data collection and processing. But the robopocesses built into these systems rarely act only as intended. This chapter considers the implications of ubiquitous surveillance for public life in the United States, with a particular focus on the desire to mobilize automated data collection and analysis to create new forms of predictive power.

The View from Above

In the world of U.S. military planning, the conventional focus on land, sea, air, and space has been extended via the War on Terror to include a new strategic domain: information. A host of new institutions—the U.S. Cyber Command, for example, which launched in 2009—now engage the entire process of war digitally, allowing radical new concepts of security and threat to emerge. In this regard, the War on Terror has accelerated the digital transformation of the U.S. military, which has come to rely on a highly networked global arrangement of bases, technologies, and personnel. Given that very little in the War on Terror has gone as U.S. officials planned, these desires for ever more information and predictive power both illustrate the failures of counterterror and install a new governing ambition to overcome those failures via increased data collection. The U.S. Department of Defense is striving to establish a real-time situational awareness of large areas on planet Earth as part of the War on Terror. The geographic scope of U.S. war fighting today stretches from Afghanistan to Iraq to Yemen to Somalia and involves scrutiny of many other countries. The

technological push within the U.S. military has been for automatic, full-time surveillance of these sites and populations. Emerging technologies enhance established satellite-based surveillance systems and on-the-ground human monitoring to create new redundant and overlapping domains of digital data interacting on computer screens across the global U.S. military footprint (with as many as eight hundred bases outside the continental United States,[10] as well as key facilities in Washington, Virginia, Colorado, and Nevada for running counterterror operations). This push for new capacities and strategic information demands a constant increase in experts, technologies, and resources. In 2015, for example, the U.S. Department of Defense (DOD) announced the formation of a cross agency "Cyber Mission Force"—a $1.8 billion commitment to forming 133 teams (made up of more than six thousand experts) to focus on various aspect of cyber war and defense.[11] Thus, in addition to new digital infrastructures are scores of new information technology professionals, charged with protecting DOD networks from attack while fighting cyber wars and counterterror on a vast number of scales.

Consider the Autonomous Real-Time Ground Ubiquitous Surveillance Imaging System, also known as ARGUS-IS, created by the Defense Advanced Research Projects Agency (DARPA). ARGUS-IS is a new surveillance platform designed to fit on an unmanned aerial vehicle (UAV, or drone). It can hover twenty thousand feet above a territory while capturing high-resolution video over a ten-square-mile area. ARGUS-IS is capable of six-inch resolution on the ground and can capture more than one million terabytes of high-resolution video per day. The problem with real-time surveillance of this kind quickly becomes one of too much information and the limited bandwidth available for truly global scale operations. Thus, the program operates as much at a conceptual level as a practical one, but it nonetheless installs the possibility and official desire for new forms of 24/7 regional surveillance. Computer software designed to interact with the vast video stream from ARGUS-IS attempts to track in real time every moving object, promising a host of techniques for interacting with the marked data (people, vehicles, buildings). Left out of the promotional materials for ARGUS-IS, and similar programs, is the current error rate, the challenge of storing the vast amounts of collected materials, and the energy resources needed to maintain such a system. But in the counterterror world of ubiquitous surveillance failure merely produces calls for the next-generation system and thus is folded into the dynamic of the system itself.[12]

In congressional testimony on DARPA's programmatic work, then director Regina Dugan commented on the trajectory of UAV research, focusing on the precursor and follow-up technologies to the ARGUS-IS surveillance system:

> The UAV capabilities deployed on the battlefield today started in DARPA in 1984 with Project Amber, the original goal of which was to create a long-endurance, low-observable UAV with sophisticated sensors for photographic reconnaissance and electronic intelligence missions. From the small WASP to the Predator to Global Hawk, these systems now number hundreds in Afghanistan and Iraq. What once seemed impossible has become routine. In the very near future, the United Sates Air Force will train more UAV pilots than conventional pilots and today we talk about "blackening" the sky with such systems. This progression characterized many of DARPA's advances: first impossible, then improbable, eventually inevitable.[13]

In her testimony, Dugan connects the development of the state-of-the-art ARGUS-IS to a gigantic next-generation surveillance system called the Integrated Sensor Is Structure (ISIS). She notes that ISIS is an unmanned airship the "size of a 15-story apartment building" and capable of "extremely long-range continuous surveillance."[14] Thus, the announcement of an unprecedented new capacity (ARGUS-IS) is immediately connected to the promotion of a next-generation system (ISIS) that promises to extend and enhance ubiquitous surveillance temporally, spatially, and in terms of military utility. DARPA's ultimate goal is obvious: to develop a permanent, high-resolution, real-time, regional scale surveillance system with perfect tracking and identification mechanisms. One could imagine such a device hovering over every city on the planet in the near future, collecting data of all kinds while targeting particular kinds of activities and subjects. This commitment to constant technological revolution is reiterated throughout DARPA's mission statement and programmatic materials and is characteristic of the larger counterterror state apparatus.[15]

ARGUS-IS is notable for its visual range and analytic flexibility as well as the unusual degree of publicity DARPA provided on a new military surveillance system. DARPA released images from ARGUS-IS—see figure 7.1—taken over Virginia to show its photographic resolution and geographic reach. DARPA also allowed Boston-based Public Broadcasting System station WGBH to film the use of ARGUS-IS imaging and tracking software to demonstrate how the system could follow all moving objects in a large urban area.[16] In these promotional materials we learn that the first innovation of ARGUS-IS involves linking 368 sensors from common cell phone cameras to create a very-high-resolution (1.8 gigabyte digital stream) video capture device. As with all big data projects, ARGUS-IS requires advanced algorithmic systems to manage the data stream as well as produce useful information from it. What is remarkable here is less the goals of ARGUS-IS—a logical descendent of the first use of balloons and early avian technology for

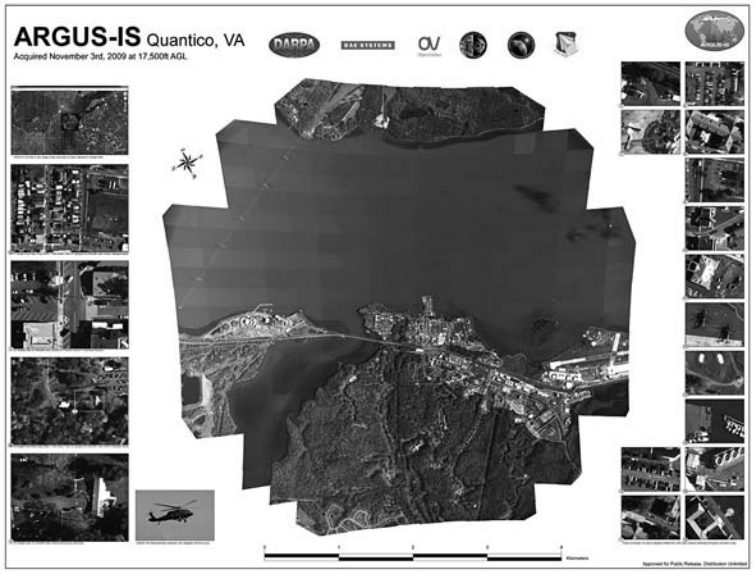

FIGURE 7.1. Illustration of the ARGUS-IS photo resolution. Courtesy of DARPA.

surveillance[17]—than the hack of commercial technology itself. The smartphone becomes here a vector for automated surveillance not only in its intended domestic use as a digital interface but also by linking the individual user to advanced military weaponry through shared circuitry. This slippage from the commercial to the military is widespread today: the DOD software devoted to tracking moving targets and facial recognition emerged less from weapons laboratories than from the commercial worlds of sports and gambling. The technologies developed to televise stadium sporting events—with cameras tracking not only the game but also the reactions of spectators—informs ARGUS-IS software. Similarly, the surveillance systems devised for casinos—where an attention to minute human gesture inflects interpretations of honest versus dishonest gamers and where 24/7 surveillance has long been required—is also centrally involved in contemporary military applications. But the consequence of error in these civilian systems is radically different, as are the possibilities for human intervention. Unlike casinos and stadiums, where human intervention can check and correct findings with little cost, war by remote control produces unintended casualties. Indeed, drone warfare has created a new category of victim, one killed or injured by bad video feeds, slow interfaces, blurry footage, and false positive identification. Think of this as the new world order, where technological innovations in communication systems (smartphone sensors) and entertainment industries (facial

recognition software) have rebounding implications across the domains of policing and counterterror, creating new abilities but also new automated domains of mechanical failure and automated violence. And just as commercial technologies inform new military capabilities, the achievements of DARPA and a host of other military research and development projects produce machines, practices, and ideas that move from overseas battlefields to domestic life (drones and highly militarized police departments are but a few key examples).

Consider how U.S. intelligence agencies are anticipating the increasing use of sensors and Wi-Fi connections on domestic appliances, a movement alternatively called the "smart home" or the "Internet of Things." Before he was forced out as director of the Central Intelligence Agency (CIA) for sharing classified material with his biographer (ironically revealed by his use of insecure email), David Petraeus gave a presentation to military contractors on what the digital future holds for global spying. The Internet of Things, he noted, will enable nothing less than a new era of surveillance in which

> items of interest will be located, identified, monitored, and remotely controlled through technologies such as radio-frequency identification, sensor networks, tiny embedded servers, and energy harvesters—all connected to the next-generation Internet using abundant, low cost, and high-power computing—the latter now going to cloud computing, in many areas greater and greater supercomputing, and ultimately, heading to quantum computing. In practice, these technologies could lead to rapid integration of data from closed societies and provide near-continuous, persistent monitoring of virtually anywhere we choose. Transformational is an overused word, but I do believe it properly applies to these technologies, particularly to their effect on clandestine tradecraft.[18]

Here, Petraeus acknowledges that the evolution of the smart home and smart city as highly networked technological systems are open to endless forms of exploitation. The Internet of Things transforms computers, phones, televisions, transportation systems, refrigerators, toasters, coffeemakers, electrical sockets, thermostats, security systems, and traffic lights all into information-gathering technologies. The increasing use of sensors and Wi-Fi across everyday objects will generate new scales of data on human activities, while offering the possibility of "persistent monitoring" of everyday life—and do so for any agency, group, or individual that has technical access. The enormous amount of data generated by smart systems in both their individual and collective forms requires automatic collection and analysis and pushes surveillance ever more directly into forms of artificial intelligence. Machines

will increasingly collect, store, and analyze the sea of big data generated by wired technologies and systems of all kinds. To attempt privacy in this near future, one will have to physically remove all microphone, camera, and textual-capture technologies out of a given space, attending to the fact that even power sockets and light switches are becoming "smart."

Pattern recognition necessarily replaces human judgment in these emerging systems, creating new forms of political agency but also new forms of radical contingency and ground for covert manipulation. As Aradau has perceptively argued, these practices have an "occult quality" because consumers or targeted subjects cannot participate in the production of knowledge but rather can only receive the claims of big data analytics.[19] The assumption of a fully automated system is that it eliminates the human factor, banishing error while increasing the computation force of pattern recognition to identify as yet unknown subjects of interest to the state. However, as we shall see, each of these technologies also requires system operators, some of whom have agendas of their own, and the ever-increasing pool of data—collected across myriad and diverse sources—produces not only friction between data sets but also a foundational challenge in terms of the sheer volume of global data being generated every second of the day. The National Security Agency (NSA) is feverishly building data storage facilities today to deal with the volume and historical depth of digital information, attempting to capture and store years, and even decades, worth of information in targeted countries. But the volume alone creates problems that can only be managed with new infrastructures, mirrored in the "cloud" storage facilities of the big information technology companies including Google, Yahoo, and Amazon—energy-intensive facilities that generate an ever-larger carbon footprint on a warming planet.

But given the projected proliferation of data under an Internet of Things, a complete capture of planetary-scale digital data is still an anticipatory commitment of the counterterror state. It is a projection, an ambition, rather than a reality. It is important to remember that the militarized dreams of a perfect digital capture of human intelligence through automated collection and pattern recognition rides on top of a new kind of political economy of data itself, one subject to error, false positives, willful obfuscation, and hacking. In other words, the automated aspect of ubiquitous surveillance does not eliminate error, contingency, or manipulation, but it does reterritorialize the location of such effects: it makes error more difficult to assess in real time and expands radically the potential scope and consequences of unintended effects. For Pasquale, the immediate danger in this "black box" society derives from the secrecy attached to the algorithmic processes (in their proprietary corporate or national security forms), which renders informed judgment impossible.

He contends that "in a climate of secrecy, bad information is as likely to endure as good, and to result in unfair and even disastrous predictions."[20] Thus, the opposite of an automated prediction capability is automated distortion, and even sequential crisis, such as the global financial crash of 2008, the continuing "collateral damage" of drone warfare, or the media campaigns around key elections from the British vote to leave the European Union to the 2016 U.S. presidential contest.

Pattern Recognition

A vital aspect of ubiquitous surveillance involves the conversion of large data sets into usable knowledge via algorithmic analysis. This "pattern recognition" often involves linking discrete data sets (within and across platforms) and performing a mathematical assessment of relationships within that field of information. *Data friction*, the incompatibility between different kinds of information, is rendered invisible by such processes. This kind of friction is important because it is now possible to leave a digital footprint of most daily activities, distributing metadata and content across corporate networks, a record of purchases, interests, activities, movements, and communication. The assumed flatness and transferability of data across platforms and collection sites is a threshold moment for global order: ubiquitous surveillance promises an expanding set of tools for understanding populations in terms of consumption, health, travel, and communication but also unprecedented possibilities for manipulation and new kind of information warfare. The consumer-subject that emerges from such big data practices is not a citizen but rather a discrete set of relationships, a type that has meaning for commerce, politics, or security. The big data sets produced by social media, credit cards, and smartphones are both infrastructures and commodities in and of themselves—part of what Paul Edwards would call "infrastructural globalism," or the way in which science, commerce, and security increasingly understand their key objects of concern as growing archives of planetary-scale data.[21]

Chicago is pursuing a smart city concept called the "Array of Things," a project to install sensors throughout urban space to measure weather, air quality, noise, police activity, and a variety of unspecified domains. Five hundred sensors are being installed throughout the city in an effort that began in 2016 and was expected to continue for several years, and the data they produce will be open-sourced to government administrators, scholars, and the public. The Array of Things promises "real-time, location-based data about the city's environment, infrastructure and activity to researchers and the public" in hopes of increasing the quality of life, the efficiency of government,

disaster response, and policing.[22] Its experimental promise is enormous, producing big data sets on environmental conditions.[23] As an experiment in open-source data, the project is also highly interesting, enabling unforeseen uses of the real-time monitoring by individual citizens and organizations. Thus, there are a variety of environmental justice and arts projects that are likely to emerge from this new infrastructure of data, as well as great uncertainties as to its implementation and governance. This vision of the smart city assumes that better data will produce better administration, but, like any new technology, its social use is dependent on the values, democratic commitments, and integrity of its process. The Array of Things is a vanguard project imaging future megacities as informational nodes, allowing constantly improving governance and quality of life. This investment also comes in a particular historical moment and resides within an existing set of political structures committed to a neoliberal logic of market-based future engineering. Thus, just as war is waged differently by a counterterror state armed with robotechnologies, the "smart" city is inflected by the economic reasoning undergirding its development and administration.

The city of Chicago, for example, in the 2010s carried a phenomenal public debt problem—more than $63 billion in unpaid liabilities (the result of decades of mismanagement of pensions and city budgets). Automated urban infrastructures have been offered as a source of both modernization and profit in the twenty-first century, a way of investing in the city through privatization. To take one example, Chicago in the early 2010s was the U.S. leader in red light cameras (RLC), an automated camera system that issues tickets to vehicles speeding through intersections. Designed and administered by a company called Redflex Traffic Systems, the cameras are automated, using sensors on the road linked to photographic cameras to document speeding infractions; tickets are then generated and mailed to the registered owner of the car with a photo of the vehicle in illegal motion. This robosystem is always on, relying on an automated evaluation of vehicle velocity and traffic lights—a new microsecond field of mechanical judgment with a $100 ticket at stake. At its peak, Chicago had more than 350 of these cameras operating around the city, ceremoniously installed with the official promise that the cameras would reduce traffic accidents and improve public safety. By 2014, Redflex was mired in two major scandals, which are diagnostic of the new world of ubiquitous surveillance technologies. The first scandal involved revelations that the Redflex CEO had bribed Chicago city officials to the tune of $2 million to get the $124 million RLC contract, a reminder that each new surveillance technology is also a mode of capitalism (and thus subject to both market logics and corruption in its build-out and servicing). The second

scandal involved the day-to-day implementation of the RLC program itself. In a 2015 review of four million tickets, the *Chicago Tribune* documented frequent inexplicable spikes in red light ticketing.[24] Subsequent study showed that by lowering the assessment of traffic light changes by a tenth of a second, the RLC program was able to exponentially increase the number of tickets issued (which were almost impossible to challenge in court due to the automated nature of the system) and thus generate more profits. In the end, the RLC was less a policing system than a new kind of extraction mechanism, an automated means of taking money from drivers in a manner difficult to contest, one that also created criminal liabilities for nonpayment.

Thus, a roboprocess that was supposed to produce "error free judgments" and fewer traffic accidents instead installed an entirely new field of automated fraud. Not surprisingly, the Redflex system is in litigation today but the cameras remain largely in place. The City of Chicago also privatized and automated its parking meter system in 2008 (famously written about by Matt Tiabbi in *Griftopia*[25]). Leased by the Richard M. Daley administration for seventy-five years in exchange for $1.1 billion up front, the program has since turned city parking from a largely a nine-to-five workweek affair into a 24/7 system with no appeal process for false tickets or the once regular holidays breaks. Such automated systems become naturalized infrastructures on installation and, without care in the design and implementation, can produce nondemocratic mechanisms of control (that also render race- and class-based inequalities increasingly difficult to identify). Chicago city managers remain committed to the smart city concept and are energetically placing sensors throughout the city, arguing that big data analytics will necessarily produce a more efficient city. But roboprocesses are not immune to the value systems generating their construction and can as easily be deployed for fraud or more authoritarian modes of social regulation. Or, as Cathy O'Neil puts it, these technologies can be "weapons of math destruction," systems running on algorithms that do not replace politics with impartial order but do reterritorialize and render invisible discriminatory practices.[26]

In this regard, the classified NSA documents leaked to the press by Edward Snowden[27] are important for two key reasons: (1) they show the capacities and appetites for digital surveillance on a new scale and scope in the United States, and (2) they show how alignments (some willful, some coerced) between security agencies and information technology companies eliminate meaningful distinctions between public and private, corporate and state, commerce and citizenship. The NSA documents leaked by Snowden reveal widespread, systemic state efforts to compromise existing information technologies and to use the big data produced by Google, AT&T, Yahoo,

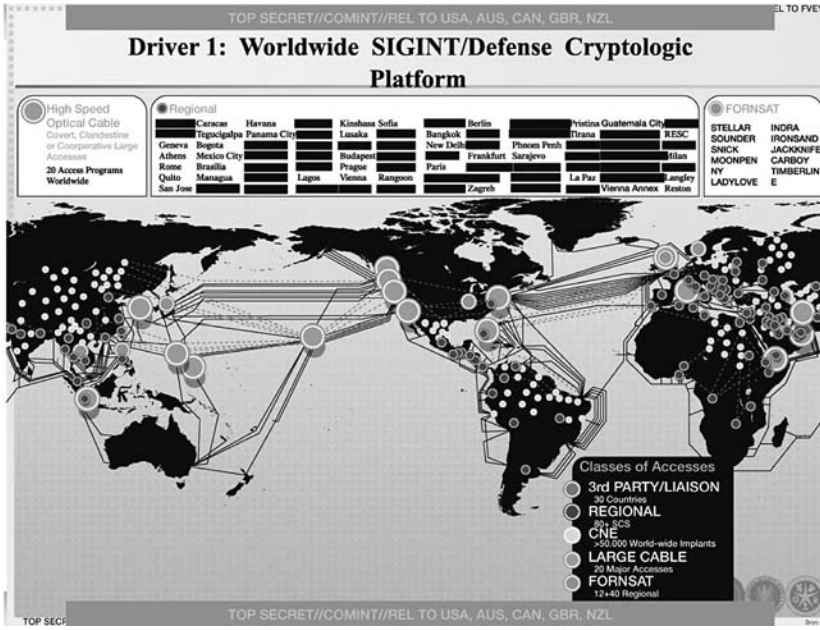

FIGURE 7.2. Illustration of top-secret NSA efforts to access the infrastructure of the internet, as released by Edward Snowden.

Facebook, Amazon, and others to enhance predicting policing under the logics of counterterror. Figure 7.2 is a classified but now also widely distributed slide of the NSA's "Defense Cryptologic Platform," a collection of programs to tap into the optical cable backbone of the global internet. The slide identifies twenty named programs to tap into the physical cables, involving more than eighty regional points of access in global cities, as well as agreements with thirty governments, and the covert use of malware to make as many as fifty thousand targeted computers worldwide available for NSA exploitation.[28] The slide reveals how corporate and foreign national data become recast as vital U.S. national security data, revealing layers of redundant and competing surveillance programs that strive for global reach and capture.

The Snowden files also revealed an NSA program known as PRISM, which combines the data gathered from leading information technology companies and turns the combined data sets (linking email, photos, chats, text, and video) into a searchable domain.[29] PRISM data-mines the collected digital traces (both metadata and content) from Microsoft, Google, Yahoo, Facebook, PalTalk, YouTube, Skype, AOL, and Apple and transforms them into patterns that can have both an individual name and a threat level (figure 7.3). PRISM reveals that one covert aspect of the information revolution

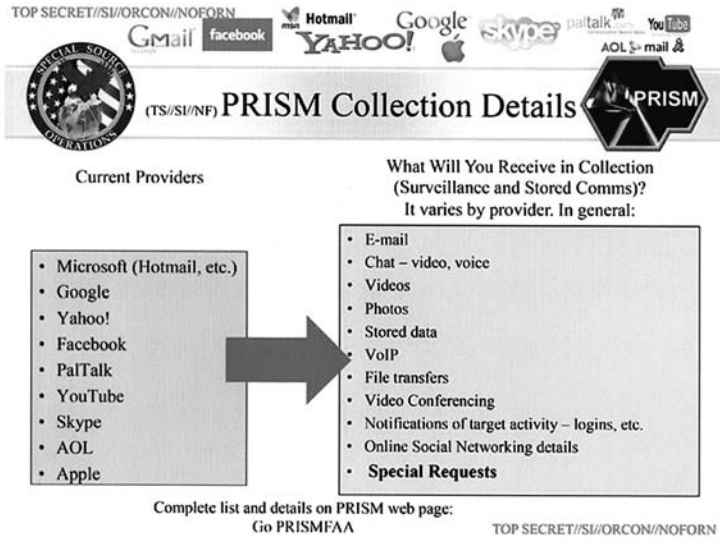

FIGURE 7.3. Illustration of data-collection details for top-secret NSA program called PRISM, as released by Edward Snowden.

has been a systematic effort by the U.S. intelligence agencies to build access into key information technology infrastructures or induce access to corporate data sets as part of a full-spectrum digital surveillance endeavor. As of this writing in mid-2018, the constitutionality of PRISM and related programs is being litigated in the United States, but the commitment to ubiquitous surveillance is clear. A threshold moment of public awareness has, in fact, been reached: because of the Snowden NSA documents, we now know that if you use a cellphone, a computer, or a credit card, you are interacting with competing and sometimes aligned corporate and national security data projects. Some consumers acknowledge these facts today by trying to distort the systems, to deploy misinformation about themselves, to obfuscate their digital footprint. Some do so by adding aggressive taglines to their emails such as "terrorist" or "WMD" as an act of resistance to counterterror, while others create false gender or racial profiles for social media or add software designed to strip away their identifying marks (an act which can actually trigger more intense scrutiny by the counterterror state apparatus). As discussed in Robert Gehl's chapter of this book, as both state and corporate projects automatically collect, store, and screen for particular qualities and interests, they then try to act on that assessment. But even as corporations

track individual interests online with increasing precision and then try to direct advertising based on those interests, we can see the limitations of the current systems: directed advertisements usually *follow* purchases, which can make similar ads redundant, or are based on patterns of interest across page views, which can misread the gender or intent of viewers. These limitations drive research into more immediate form of engagement and manipulation: Facebook has experimented with changing the news feeds for some of its users, an effort not to respond to individual interests but to influence and direct mood.[30] This kind of social media research on "emotional cognition" or to create "psychographic profiles" of users attempts to manipulate affect via changing viewable content. These practices have produced a substantial public backlash against Facebook, which claimed two billion active users in 2017, particularly as the openness of its platform to propaganda efforts may have negatively influenced elections worldwide. The twin revolutions of our historical moment—information technologies and counterterror—align here to constitute not only a rapidly shifting social contract but also the engineering of a new society, one which seeks to make the individual increasingly transparent to corporate and state interests that are in turn increasingly proprietary or classified and not subject to democratic review.

Opting Out

In the twenty-first century, there has been a relentless public recruitment to participate in digitally mediated social projects—to wear a sensor to record vital health factors, to orchestrate one's transportation via smartphone applications, to share details of everyday activities and thoughts for known and unknown readers on social media, to organize group activities (from sports to political protests) via Twitter, and to convert music, films, books, and intellectual pursuits to digital platforms—in other words, to embrace as a personal and public good the very tools that make ubiquitous surveillance possible. The resulting practices leave not only a spectrum of digital tracks that can be exploited by companies, security states, hackers, and criminals alike but also makes opting out of the digital society increasingly difficult. Those who do not carry a cell phone, for example, once had access to a vast national infrastructure of public landline telephones, the services for which they could pay with the coins they carried in their pocket or purse. With the rise of the smartphone, public pay phones have been largely eliminated in cities and are increasingly difficult to find within public spaces of any kind. Similarly, the social codes people relied on for generations to find one another in public spaces are disappearing, replaced by an expectation of instant

communication, 24/7 access, and last-minute calibration. These are subtle cultural shifts and a marker of the advent of the information society, a society that redistributes inequalities alongside the access to not only information technologies but also the training needed to understand their uses and vulnerabilities. Julia Angwin has documented how difficult it is to use the internet (to send email, use a credit card, or have a cellphone today) and still maintain control of one's information.[31] Declaring the United States nothing less than a "dragnet nation," she found it all but impossible to reclaim her data from corporate systems or fully extricate herself from digital collection programs that collect information on not only users but all subjects.[32] Indeed, most people today are caught in interlocking, overlapping, and competing modes of digital surveillance, most of which offer little in the way of transparency about how data sets will be used, how long they will be stored, and how pattern recognition will be used to influence future activities. These new realities create a range of public counterformations and new opportunities for reverse surveillance practices.

Consider the largely analog world of the Surveillance Camera Players (SCP), a New York–based performance art group that has tracked the deployment of street-level cameras in Manhattan since the late 1990s. Members perform antisurveillance plays in front of security cameras, draw maps of camera locations, and give walking tours of neighborhoods with cameras, tracking the proliferation of security lenses across city government, policing, and corporate platforms. SCP has documented, for example, that the East Village neighborhood of New York, a quickly gentrifying immigrant neighborhood, has witnessed an explosion of surveillance cameras in the twenty-first century, moving from 96 visible cameras in 2001, to 298 in 2005, to 1,275 in 2015.[33] Most of these cameras are not owned by the New York Police Department or other city agencies but by apartment managers and businesses installing the technology in hopes of signaling "security" to residents and visitors alike. Nevertheless, street-level interactions are now subject to recording by always-on cameras from multiple vectors, crossing public, private, policing, and national security interests. Footage is controlled by diverse systems operators and subject to capture by anyone with the knowhow (think here about collection impulses behind the ARGUS-IS or ISIS platforms of NSA's PRISM program). Figure 7.4 is an SCP hand-drawn map of cameras in Washington Park, illustrating the difficulty of moving through public space in New York without being recorded on multiple platforms. If early privacy activists sought to map a path across the city that would avoid cameras and resist complicity with ubiquitous surveillance, the SCP shows the systematic effort to eliminate nonsurveilled spaces on the ground. The use of drones and satellites, as well

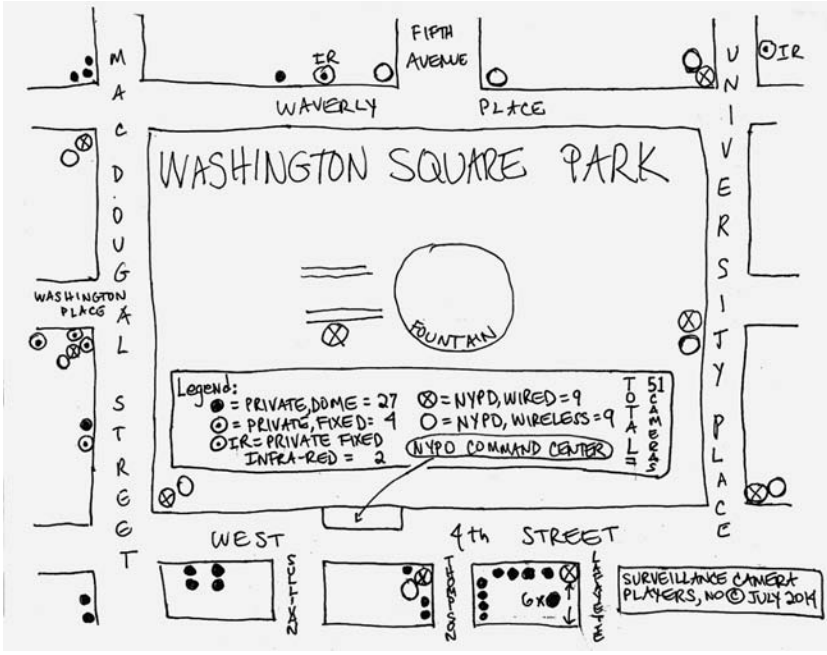

FIGURE 7.4. Map of cameras in Washington Square Park in New York, hand-drawn by the Surveillance Camera Players (SCP), 2014. Courtesy of SCP.

as hidden cameras, multiplies the platforms for continuous surveillance of urban space. Of course just because there is a camera in place does not mean there is an observing human eye watching and interpreting street behaviors, but the world of roboprocess is working hard to automate that review. Indeed, as the capacity to store digital video data grows exponentially, there is an expectation being naturalized to build a future world in which all outdoor events can be reconstructed using the multiple cameras now involved in always-on recording. In other words, the Internet of Things is both inside and outside the home, promising a matrix of data collection points across the built environment, now or in the near future.

But if it is increasingly impossible to avoid surveillance in public spaces or while online, the miniaturization of surveillance technology in the form of the smartphone camera can empower new modes of countersurveillance. In 2015, police shootings of African American citizens escalated a recurring national scandal. It did so because cellphone cameras from passersby recorded the violence and immediately uploaded the footage to the internet for global review, creating waves of outrage and calls for police reform. Browne makes the crucial point that surveillance, as we now know it, began in the Atlantic

slave trade, a process which merged dehumanization, commodification, and the desire for real-time scrutiny of human cargo as foundational to modern capitalism. Browne alerts us to the fact that surveillance and counterforms of "sousveillance" emerged out of antiblack and settler colonial violence in the United States.[34] Thus, the technological revolutions informing ubiquitous surveillance today do not begin as neutral forms of interest or awareness but are always already embedded in unequal and violence-laden social orders. Similarly, the cellphone video footage of human rights abuses from the War on Terror—the drone killings of wedding parties in Afghanistan or the Abu Ghraib images of prisoner abuse from Iraq—enabled new kinds of public scrutiny of those in military power. However, these public scandals also increased the intensity of official efforts to control the infrastructures of digital communication. This loop is important as it reveals how thoroughly politics has been digitized since the emergence of the smartphone and social media. Indeed, perhaps the surest sign of American commitments to ubiquitous surveillance is that the wave of domestic police shootings have primarily produced collective calls not to change the nature of policing itself but rather to place cameras on police officers to record their formal activities. Like the Internet of Things, police are increasingly nodes in a larger information system, one that promises accountability through digital visibility, while not guaranteeing either justice or peace.

But if opting out of ubiquitous surveillance is increasingly impossible in a world of smart technologies, smart cities, smart bombs, satellites, PRISM, and ARGUS-IS, the digital future is also subject to contingency and alternative engineering. As we have seen, every digital platform that is presented as fully automated still needs system operators, people who can influence the use and outcome of the technology. Chelsea Manning and Edward Snowden have offered powerful examples of how midlevel employees can turn even the most covert of systems into a global conversation. All infrastructures have in their makeup the terms not only for future crisis but also for alternative uses and counterappropriations. The emerging world of ubiquitous surveillance is not, then, one that eliminates terrors, corruptions, or violence via perfect hegemonic mechanisms of technical control. But it does reterritorialize the ground of the political, dangerously seeking in algorithms that which has not been done through formal democratic processes. This requires that we pay serious attention to the politics of data collection and use and that we fundamentally challenge the assumption that roboprocesses are somehow inherently more egalitarian or apolitical than face-to-face encounters. It also means that the administrative contours of "predictive" analytics is increasingly where the American social contract is being made, articulated, and felt.

8

Controlling Numbers: How Quantification Shapes the World

SALLY ENGLE MERRY*

We are used to using numbers to describe economic processes and viewing them as authoritative and reliable descriptions of economic activity. They are routinely accepted as a reasonable basis for policy decisions. Statistics such as gross domestic product (GDP), the unemployment rate, and credit ratings for individuals and for securities are typically assumed to be objective and reasonable measures of economic activity. The development project is increasingly governed by a set of numerical goals, the Millennium Development Goals (MDGs), replaced in 2015 by a new set of Sustainable Development Goals (SDGs).[1] These numbers are widely used as good ways to measure national progress toward development goals and economic functioning. But this is only the tip of the iceberg in the role that quantification now plays in shaping the world we live in. Numerical measures, or indicators, are used as the basis for policy making, governance, and myriad individual decisions such as where to invest funds, which college to attend, which teachers deserve raises, and which city is most livable. Indeed, our contemporary reliance on numerical data for life decisions is growing every day as an ever-widening range of experiences and dimensions of social life is converted into numbers.

Yet, we know relatively little about how these numbers are created or what is lost. An ethnographic look at how these numbers are constituted shows that they are based on a series of pragmatic decisions about what categories to include and which to leave out and which things are countable and which are not. There are myriad gaps where data is missing, of poor quality, or based

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on proxies that were designed to measure something else. Committees of experts make decisions about what to count, how to categorize, and how to deal with missing data. Numbers often provide a distorted picture of the situation they endeavor to describe because of limited or inaccurate data, counting phenomena that are not readily countable, the demands of making diverse entities comparable, and the inability to include wider contextual variations into the measurement system. Any system of counting requires substantial interpretive work in deciding what to count, how to categorize it, and what to call what is measured. Since such systems of quantification have important knowledge effects, in that they offer a picture of the world, and governance effects, in that they determine policy, they are significant site of power. Yet, this is a site that is relatively unrecognized and untheorized.[2]

Quantification can be described as a *roboprocess*: a form of automation that becomes naturalized and taken for granted over time and that depends on established routines and practices. New projects of measurement typically build on past models and often rely on existing data rather than new sources of data. Quantification can have both constructive and harmful effects: it can reveal patterns of discrimination and inequality, yet it can also conceal or obscure inequalities. It is important to peer into the black box of measurements such as social indicators to see how they are made and to what extent they distort and misrepresent reality. As the demand for quantification spreads to new areas, such as corruption, the rule of law, the quality of life, and even happiness, the importance of quantification as a form of knowledge and a basis for policy decisions becomes ever more significant, and the consequences of its distortions more serious. Some categories are not counted at all, such as women's unpaid labor in the home. Context is rarely measured, so that the incidence of events such as domestic violence maybe counted, but not the surrounding social, cultural, and emotional dimensions of an incident or its trajectory. Particularly in poor countries, the cost of data collection means that data quality is often poor or missing.

The turn to numbers as a mode of evaluating social and economic life is a historical development initiated during the emergence of nation-states in the nineteenth century.[3] With the growth of the modern state, whose wealth depends largely on its population rather than on its territory or control over trade routes, it became increasingly important to know about this population: its health, education, capacities, and birth and death rates. States began to collect statistics about these issues through vital registration, censuses, and surveys. In the early twentieth century in the United States, surveys expanded into new domains, such as political preferences and sexual behavior. Americans became accustomed to being surveyed and counted.[4] With the

encouragement of the United Nations and global development agencies, the global production of economic data and population surveys has expanded, with poor as well as rich countries investing in counting and measuring its people. The turn to measurement was based both on a new concern with governing populations and with reform agendas such as improving public health and diminishing discrimination in school admissions. For example, the use of standardized tests for college admissions revealed the existence of quotas for religious minorities in the United States.

The need for numbers and the authority they exercise as a form of knowledge and an aid to governance is now largely taken for granted. Although there are some contemporary debates about privacy with the expansion of attention to big data, to a large extent the creation of quantitative data about populations and the use of this information in both private and public modes of governance is widely accepted. Yet, a closer look at how such numbers are constructed, the difficulty of challenging them, and the extent to which they are fundamental to knowledge and governance suggests that they are a largely unrecognized field of power. Beginning with some key economic numbers—GDP and MDGs, I then turn to the use of indicators in newer domains—education, rule of law, and combating slavery. These case studies show that as this technology of knowledge expands into less readily quantifiable fields, it becomes increasingly problematic. This does not mean that numbers are of no value as a form of knowledge and as guides to decision making. It does suggest the importance of a healthy skepticism about what they measure and what they fail to measure and the need to question where they come from. Counting things is an invaluable strategy for producing knowledge, but its value depends on being clear about what is and is not being counted and how the numbers have been interpreted. Although I have done ethnographic research on the quantification of human rights, violence against women, and sex trafficking,[5] this chapter relies largely on the work of other scholars.

Economic Numbers

Quantifying economic activity is clearly facilitated by the use of money, which enables commensuration across a wide and diverse range of goods and services from tables to travel to therapy. All can be compared by price. One of the most prominent economic numbers is GDP.[6] This basic, powerful number is based on market prices for the sum of goods and services produced within a country. It is usually measured annually and assesses the value added by economic activity. GDP includes private consumption, business investment, government expenditures, and exports minus imports, thus

providing a measure of a nation's overall economic activity. Developed in the 1930s, GDP was widely adopted as a tool to measure the total production of an economic system after the Bretton Woods conference in 1944. By the 1950s, it became a global concept used to compare the overall health and functioning of all countries and is widely used by international measurement systems. Thus, the system of measuring economic activity, and its inclusions and exclusions, was developed in the global North and applied to the global South. Economic activities that fall outside the cash economy—for example, subsistence farming or unpaid care work such as raising children or feeding the elderly—are difficult to measure within this system. Consequently, GDP undervalues these economic activities.

Yet, there are serious limitations to the GDP measure. As Lorenzo Fioramonti points out, it does not include the depreciation of assets used in production, such as machinery, tools, and vehicles.[7] This depreciation includes the use of natural resources consumed during production, which are assumed to be provided free of charge by nature. Such uncounted resources include the fertility of soil, systems of pollination, clean water, pockets of oil and gas, and the power of the sun. Thus, GDP excludes the economic costs of pollution and environmental degradation as well as the impact on the supply of natural resources and the fact that they are not all renewable. It is based on production and property, thus measuring the benefits to their economic owners.[8] Natural capital is systematically neglected by official GDP statistics.[9] According to some critics, if the contributions of nature were properly valued and incorporated into calculations of economic performance, we would better recognize their contributions to economic welfare and would be more likely to emphasize environmental preservation in macroeconomic policies.[10]

Nor does GDP measure informal economic exchange or activities outside the market such as irregular jobs and the informal exchange of goods and services, gift exchange, or people who produce for their own consumption.[11] It does not count work carried out by unpaid household workers, such as child care, cooking, care of the elderly, and education—activities typically performed by women. Yet, a study in the United States found that such productive activities within homes accounted for more than 30 percent of economic output every year from 1965 to 2010.[12] Finally, it does not include illegal activity, which also can make up a substantial proportion of economic activity. Fioramonti concludes, quoting from the *OECD Observer*, that GDP measures income but not equality, growth but not destruction, and ignores the values of social cohesion and the environment.[13] Thus, in some ways this measure is more reflective of the values of the global North than those of many countries of the global South.

Not only is GDP conceptually limited in ways that seriously understate the natural resources used in economic activity and the contributions of unpaid and illegal workers, but its numbers are often based on inadequate and misleading information. In his insightful study of economic statistics in Africa, Morton Jerven points to the serious gaps and flaws in economic statistics for many African countries, as well as the difficulty of gathering accurate information on the entire range of economic activities.[14] Subsistence farming and daily harvesting from kitchen gardens or nearby trees and fields are not tabulated, for example, and assessing overall agricultural production is difficult. Thus, this system can underestimate the strength of the agricultural sector and fail to take into account the significant contribution of subsistence activities in decisions such as replacing open lands with housing. The cost of gathering economic data is typically a major concern for poor countries, for whom even a regular census is a substantial expense. As a representative from Ghana told the United Nations (UN) Statistical Commission (the UN commission created to monitor and support global statistics) when urged to carry out a census, it is hard to justify spending the equivalent of US$50 million on data collection when there are so many other needs. The global South suffers from inadequate and missing data, which undermines its ability to set policies and distorts global comparisons.

Despite these drawbacks to the GDP measure, it is now the basis for global comparisons as well as national assessments. In 1952, Richard Stone at the Organization for European Economic Cooperation (OEEC) established a System of National Accounts (SNA) to measure economic activity, closely modeled on the GDP concept.[15] The goal was to provide governments with tools for their economic decision makers as they developed macroeconomic policies. Michael Ward observes that this system "set out a comprehensive framework that established the appropriate standard format for collecting and compiling all economic statistics. It created an interrelated network of concepts and definitions that remain more or less unchanged to the present day."[16] The SNA system now forms the basis for measuring economic activity globally. Thus, the categories and framework developed in Europe shaped the way economic relationships are now analyzed throughout the world. Although there are frequently debates about the details of the SNA system at the meetings of the UN Statistical Commission, the basic framework remains unchallenged.

There have been periodic efforts by the UN Statistical Commission to revise the SNA to deal with some of these shortcomings. In the late 1980s and early 1990s, revisions resulted in a new system, but the UN statisticians resisted including natural capital depletion. Instead, in 2012 a new system was created, parallel to and supplemental to the SNA, the System of

Environmental Economic Accounting (SEEA), to capture the informal sector, tourism, and unpaid work. It remains a supplemental system, however, and does not escape the limitations of the GDP framework.[17]

Moreover, international organizations' demands for data entail enormous expense. Jerven notes that the pressure to produce data to comply with the global governance regime established by the MDGs is so high that it often pushed other measurement goals off the table.[18] But, as onerous and expensive as the MDGs were, their cost pales in comparison with that of the proposed SDGs, implemented in 2015. Instead of the MDGs' eight goals, twenty targets, and sixty indicators, the proposed new system has seventeen goals and 169 targets. The UN Statistical Commission has developed 232 indicators for these targets.[19] Jerven estimates the cost of measuring all these SDG targets at US$254 billion, almost twice the total annual spending on development assistance. He warns that expecting such a wide range of data will either put a huge dent in the funds available for development or foster the production of bad data based on limited data collection efforts.[20] He points out that gaps in data and poor data quality were already a problem with the far smaller set of MDGs.

Quantifying Education

As the authority of numbers and faith in quantification became established within economics, this mode of knowledge production and governance expanded to new domains. Again, the global North set the pattern for the rest of the world. Beginning in the 1980s, the UN Statistical Commission turned from its early focus on economic data to an array of new measures of gender, health, nutrition, labor participation, the environment, education, freedom, corruption, human rights, poverty, and global inequality.[21]

One of the prime examples of the spread of quantification is to the field of education, particularly the ranking of colleges and universities. The idea of publishing a ranking of colleges and universities began in the 1980s. After experimenting with a survey of college presidents asking them to evaluate the best U.S. colleges and universities in 1983, the newsmagazine *U.S. News and World Report* began to publish annual rankings of colleges in 1985. In 1987, the rankings expanded to graduate and professional schools, including law schools. From an initial ranking of the top twenty-five law schools in 1987, the system grew to include all 190 American Bar Association–accredited law schools, grouping those outside the top group into unranked tiers.[22] As the newsmagazine market collapsed, the interest in rankings soared, so by 2010, the rankings became the primary news content of the magazine. The dissemination of the rankings was facilitated by their grounding in a media outlet

and their marketability to consumers willing to pay for the information. The creators of the rankings saw themselves as producing useful information about school quality that facilitated comparisons, along the lines of *Consumer Reports*' examination of commodities.[23] The enthusiastic response of readers suggests that they were indeed enthusiastic consumers of this information.

Law schools are particularly vulnerable to rankings, in part because there is only one set of rankings of these schools.[24] Rankings of law schools are based on four main categories: reputation, selectivity, placement, and faculty resources, with measures within each category. For example, selectivity, which determines 25 percent of the rank, is based on three measures: Law School Admission Test (LSAT) scores (50 percent of rank), grade point average (40 percent), and acceptance rate (10 percent).[25] Scores from the four main categories are summed to produce a composite score that measures a school's overall rank. Clearly, there are issues of weighting and the choice of categories for comparison, yet they are typically obscured by the production of a final single score. Moreover, the translation of the rank into a discrete number suggests both a level of objectivity and a specificity that such evaluations do not merit. Thus, even schools with similar ranks are presented as varying between 87, 89, and 90, for example, as though these small numerical differences indicated a significant difference in quality. Moreover, because all schools are ranked against one another, any improvement in rank by one school inevitably means a drop by another.

What began as a national movement in the United States has now become a global one. In addition to rankings of U.S. colleges and universities pioneered by *U.S. News and World Report*, there are now other national rankings published by *Times Educational Supplement*, *Maclean's*, *Der Spiegel*, *Newsweek*, and *Asiaweek*, as well as a global system of rankings such as the London-based Quacquarelli Symonds World University Rankings (QSWUR) that began in 2004 and the Shanghai Jiao Tong Academic Rankings of World Universities (ARWU) that started in 2003.[26] The QSWUR system ranks the top two hundred world universities, and the ARWU ranks the top five hundred universities. The QSWUR relies heavily on assessments by academics, which make up 40 percent of the score, and by employers or recruiters, which make up 10 percent.[27] These international rankings are increasingly influential, particularly with students deciding among international institutions. Students are much more likely to use them to choose international schools than when they are deciding among schools in their own countries.[28] Clearly, rankings are more useful when other forms of knowledge are less available. Again, it is organizations in the global North that developed the criteria and collected the information for this global ranking system.

I have been asked to contribute to such global assessments of universities several times, making me dramatically aware of my own limited knowledge of the best world universities despite considerable international travel and scholarly contact. It was clear to me that I had no reasonable basis for assessing and ranking even twenty or thirty international universities. It is not surprising that in 2015, the top world universities were designated as the Massachusetts Institute of Technology (MIT), Cambridge University, Imperial College London, Harvard University, Oxford University, University College London, and Stanford University, all schools with high visibility.[29] All eight were ranked between 98.3 and 100.0, implying a precision to the scores that is clearly unwarranted. These are all schools with considerable name recognition, regardless of the quality of the education they provide. Not surprisingly, they are in English-speaking countries, and thus use the current global language, and located in wealthy global North countries. My own university, New York University, is ranked number 41, tied with the University of Wisconsin–Madison with a score of 82.5, while the London School of Economics is ranked number 71 with a score of 75.3. What does this mean? Does this say anything about the quality of education or only about the value of the university's brand? I find it chilling that it is the opinions of people like me, with only vague knowledge of many of these universities, who determine in some part these global rankings.

Despite the popularity of such systems of ranking, they have serious drawbacks as ways of evaluating an educational experience. As Wendy Espeland and Michael Sauder argue, law school rankings assume a single standard of performance, attuned to the values of the top-ranked schools, and fail to recognize the diversity of advantages of different kinds of law schools. For example, the law school in the United States with the top rank in 2010, the Yale Law School, trains law students for academic careers and has a very low acceptance rate, while Brigham Young University Law School, ranked number 42, offers a strong religious and ethical vision of law school, and University of New Mexico Law School, ranked number 67, is committed to training Native Americans and developing Indian law.[30] Yet, the rankings suggest that Yale is better than Brigham Young, which in turn is better than University of New Mexico, even though each of these law schools offers a distinctive program and a good education.

The process of ranking strings all the schools along a single standard, framing comparison in terms of a hierarchical ladder rather than a field of difference. The consumer does not get to choose what standard he or she values. When Espeland and Sauder interviewed educators, most agreed that the factors the *U.S. News and World Report* considers are important, but they

are not the only factors that contribute to a high-quality education. They noted the absence of assessments of teaching, faculty scholarship, student and faculty diversity, cost, social climate, and location.[31] Yet, when a ranking system is created and disseminated, the creators—not the user—choose the standards. The ranking system reflects a particular set of values, a perspective on education, and a theory about what is the best form of education. In effect, the rankings brand schools as good or bad on the basis of a set of criteria neither democratically chosen nor necessarily shared by consumers.

In practice, ranking systems tend to rely on measuring readily countable things, such as the number of books in a library or the acceptance rate, rather than things that are more difficult and expensive to measure, such as the quality of research librarians or the level of support for innovative thinking. Those who create ranking systems seek out data that is readily available, even if it is not the best measure of what the ranking claims to measure. Things that have already been counted or that are readily countable are more likely to be included than things that have not been reduced to numbers or conceptualized as countable in the past.[32] For example, it is easier to measure standardized test scores or grade point averages of students than school culture or the quality of instruction. When such concepts do need to be measured, existing numbers will often be used as proxies for more qualitative and complicated variables. For example, selectivity or test scores may be used to assess the intelligence of a student population, although neither is a particularly good measure of overall competence and performance.

Rankings have a major impact on colleges and universities, however. Espeland and Sauder find, in their interviews with students, that they are strongly influenced by the system of rankings as they choose which law school to attend. Since it is hard to for an employer to know how well a graduate will perform in any job, the status of the school becomes a useful measure in making hiring decisions. Thus, the school's reputation becomes a brand, labeling its graduates and therefore serving as an important dimension of its marketability to prospective students. Not surprisingly, law school rankings have driven law schools to extreme ends to preserve their status and prevent slippage, while consumers (i.e., students) use the rankings as a measure of the strength of the brand the school offers.[33] Such a system reinforces inequality among schools.

Law schools, colleges, and universities have adapted to the ranking system by focusing on improving the particular criteria that the ranking system measures and by "gaming" them. For example, law schools spend scarce resources to mail out expensive, colorful brochures and magazines to people viewed as "opinion-makers" in the surveys since reputation determines 40 percent of the ranking.[34] They switch to merit-based rather than need-based

admissions to raise their student test scores,[35] and they subdivide annual gifts into multiple-year contributions to increase the proportion of graduates who donate. Students with low LSAT scores are admitted into part-time or nighttime programs where their scores have less effect.[36] Schools invest resources in tracking graduates to determine their employment status, even hiring them part-time postgraduation to improve their employment rate.[37] Particularly for schools on the cusp of a tier that face the risk of a drop in tier status, rank is of major concern, and even small changes may have an impact. Alumni and trustees are distressed if a school's rank drops and may withhold support. Espeland and Sauder report that deans face the dilemma of either improving their performance on an indicator or doing what they consider best for the education of the students.[38] It is perhaps no coincidence that the transfer of the technology of counting and ranking has moved from the domain of economics to education at the same time that the provision of education has itself become increasingly dominated by the market. This system not only guides student choices, providing them valuable information about school brands, but also encourages schools to take few chances with admitting marginal students and thus serves to reinforce inequalities in admissions.

Measuring the Rule of Law

Another social field recently brought into the mania for quantification is the rule of law. While the rule of law is a broad and contested topic, there have been several projects to measure it undertaken by nongovernmental organizations (NGOs) and the UN. In 2006, the American Bar Foundation, under the leadership of William H. Neukom, former general counsel of Microsoft, launched the World Justice Project (WJP), another initiative to measure the rule of law. The initiative was supported by a large number of other American, Canadian, and international bar associations and other organizations.[39] In its first two years, the WJP spent $1.1 million developing its index with the assistance of justice experts from Yale and Stanford law schools as well as judges and lawyers in The Hague, where the International Criminal Court, the World Court, and the International Criminal Tribunal for the former Yugoslavia are located.[40] Supported by a two-year grant of $1.75 million from the Bill and Melinda Gates Foundation starting in 2007, the WJP has become an independent nonprofit organization and is now supported by many organizations, corporations, and individuals. It reported revenue of $4.5 million in 2009 and $1.3 million in 2010.[41] Thus, unlike other rule-of-law projects supported by the World Bank or the UN, this initiative is funded by private philanthropy and not subject to an international governance regime.

It is also unusual in that this generous funding allowed the project to collect its own data rather than relying on proxies such as previous research or administrative data. Data are gathered through expert questionnaires and surveys of residents of three major cities in each country. Thus, instead of depending on preexisting data (administrative records), this project is able to tailor its data collection to the questions it seeks to answer.

The index is based on four universal principles, each of which is divided into several factors. In the 2014 report, the four principles are described as follows: (1) "The government and its officials and agents as well as individuals and private entities are accountable under the law," (2) "The laws are clear, publicized, stable and just; are applied evenly; and protect fundamental rights, including the security of persons and property," (3) "The process by which the laws are enacted, administered, and enforced is accessible, fair, and efficient," (4) "Justice is delivered by competent, ethical, and independent representatives and neutrals who are of sufficient number, have adequate resources, and reflect the makeup of the communities they serve."[42] These principles are divided into nine aggregate indicators, or factors, and further disaggregated into forty-seven specific indicators, or subfactors. For example, factor 1 is constraints on government powers by law, with subfactors that assess the institutional checks of the legislature, the judiciary, and independent auditing and review agencies along with nongovernmental oversight by the media and civil society. Other subfactors are the extent to which government actors are held accountable for official misconduct and the extent to which transitions of power occur in accordance with the law.[43]

The 2014 report covers ninety-nine countries, which are ranked according to their compliance with each factor and scored between 0 and 1. For factor 1, the highest-ranked country was Denmark, with a score of 0.94, and the lowest was Venezuela, with a score of 0.17. Like the rankings of colleges and universities, this system is a ladder in which one country's advance mean's another's decline. As with educational rankings, each country has both a distinct score and a rank. Given the breadth and vague nature of the subfactors, as illustrated by those of factor 1, producing a specific number must be challenging. The fact that Albania, Argentina, Kyrgystan, and Nigeria are all scored at 0.47 while Pakistan is 0.46 and the Dominican Republic is 0.48 implies a surprising specificity, considering the broad criteria and the challenges in establishing these numbers. The numbers offer a level of specificity and clarity that the broad concepts fail to provide.

Not only does the technology of quantification render these broad concepts countable and comparable, but it also specifies and defines the concept of the rule of law. The goal of the Rule of Law Index is that of reform: as

the 2014 report states, "The WJP Rule of Law Index has been designed to offer a reliable and independent data source for policy makers, businesses, non-governmental organizations, and other constituencies to assess a nation's adherence to the rule of law as perceived and experienced by the average person; identify a nation's strengths and weaknesses in comparison to similarly situated countries, and track changes over time." It is designed as "a powerful resource that can inform policy debates both within and across countries."[44]

The WJP's interest in reform, which means persuading states to more closely cleave to its standards, is clearly demonstrated by its reports of changes in governance that have resulted from its publication and ranking systems. However, it is also clear that the WJP is working with a specific conception of the rule of law, one drawn from the Western tradition, and that through its technology of quantification and ranking, it is exerting pressure on countries to conform to this standard. By developing a set of principles and indicators to measure the rule of law, the WJP constructs and solidifies a more concrete and specific conception of the rule of law.[45] Its index operates simultaneously as a mode of control and as an agent of reform, a privately funded initiative promoting a culturally specific image of governance as a universal aspiration. In sum, this is a largely global North project aimed at putting pressure on countries around the world to reform their justice systems, a campaign largely but not exclusively focused on the global South. Its definition of the rule of law clearly draws on American conceptions, converted into numerical values.[46] Thus it serves to promote a particular vision of the rule of law through encouragement and shaming.

Measuring Slavery: The Global Slavery Index

As faith in numerical knowledge has expanded, even phenomena that are highly resistant to being counted have been swept up into the process. One of the recent entrants is an effort to measure the number of slaves in countries around the world in order to produce a Global Slavery Index, first published in 2013. This index, devoted to the idea of increasing the visibility of the problem of slavery and enticing business leaders to invest in the problem, seems to me a prime example of speculative quantification. Based on the social science work of Kevin Bales, the index provides national-level data on the extent of modern-day slavery, which "covers a set of specific legal concepts including forced labour, debt bondage, forced marriage, slavery and slavery-like practices, and human trafficking Although modern slavery is not defined in law, it is used as an umbrella term that focuses attention on commonalities across these legal concepts. Essentially, it refers to situations of exploitation

that a person cannot refuse or leave because of threats, violence, coercion, and/or abuse of power."[47] The index further defines these key terms as set out in a number of international agreements to which many countries have voluntarily agreed, with particular emphasis on child marriage and sale or exploitation of children that forces them into armed conflict, prostitution, drug trafficking, or other activities harmful to their "health, safety or morals."[48]

Yet, slavery is very difficult to count. Kevin Bales sees slavery as a social and economic relationship, grounded in cultures and societies.[49] Slavery is defined as "a relationship between individuals (as is marriage, for example), but it exists primarily within communities and is governed by those communities (also like marriage.) The slave-slaveholder relationship is marked by a much more extreme power differential than most marriages."[50] Thus, how a person becomes enslaved depends on local social practices. Determining the number of such individuals, understood as enslaved through local systems of inequality and typically held illegally and often in secrecy, is clearly murky. Nevertheless, the Global Slavery Index offers concrete numbers for all the countries it includes.

Bales's influential book *Disposable People: New Slavery in the Global Economy* famously offered the estimate of twenty-seven million slaves in the world.[51] Published by the University of California Press in 1999, with revised editions published in 2004 and 2012, the book has been translated into ten languages and inspired a film, which won two Emmys and a Peabody award. The book's huge popularity in the United States resulted in the establishment of Free the Slaves, an antislavery NGO based in Washington, DC, in 2000, and the initiation of a popular movement against modern slavery. Bales says that he realized that twenty-seven million was a very rough guess, but it has now been adopted and repeated widely.[52] In fact, he was surprised that his initial figure of twenty-seven million was picked up and widely circulated as truthful. According to Elizabeth Bernstein, the number twenty-seven million is frequently cited by a variety of evangelical Christian and secular feminist activists, NGOs, and state agents.[53]

Bales's methodological description of his research emphasizes his use of the case study approach. His 1999 book is based on five case studies: brick making in Pakistan, agriculture in India, charcoal making in Brazil, prostitution in Thailand, and water selling in Mauritania.[54] He chose a case study approach because it was a relatively noninvasive method and contributes descriptive depth to what was in the 1990s an understudied phenomenon. He moved from these case studies to a national level of analysis, following a process he earlier described as "the social science equivalent of the vacuum cleaner, sucking up data from every possible source."[55] Bales explains that for years he "collected every scrap of information [he] could find about modern

slavery," including visiting the UN, the British Library, the International Labour Organization, human rights NGOs, and charities.[56] He also spoke with anthropologists and economists:

> My approach was to pull together all the evidence I could find, country by country. When someone gave reasons why a number of people were in slavery, I took note. When two people independently stated they had good reasons to think that there was a certain amount of slavery, I began to feel more convinced. . . . I looked at every report I could find and asked, "What can I feel sure about? What numbers do I trust?" Then I added up what I had found, taking care to be conservative. If I had any doubts about a report, I left it out of my calculations. It's important to remember that slavery is a shadowy, illegal enterprise, so statistics are hard to come by. I can only make a good guess at the numbers. *My best estimate of the number of slaves in the world today is 27 million*.[57]

Bales acknowledges that this estimate was very rough. In fact, he says that he expected a critical reception of the figure but that it was "seized upon with alacrity and I found myself an 'expert.'" The number helped shift public debate from definitions to responses, but he found the reaction both heartening and worrying: "It was heartening because the response was to use the estimate in many informative ways, worrying because of an often uncritical acceptance of the estimate."[58] Thus, he is working in the domain of highly speculative quantification.

The Global Slavery Index report was first published in October 2013 and reissued annually, most recently in 2018.[59] The 2018 index provides specific numbers of slaves in 167 countries around the world and ranks them according to the prevalence of slavery in each country, the vulnerability to slavery, and the government responses to the problem. The report is produced and funded by the Walk Free Foundation, with headquarters in Perth, established in 2012 by the Australian mining magnates and philanthropists Andrew and Nicola Forrest.[60] The foundation seeks to end modern slavery through a global activist movement, research, enlisting businesses, and raising "unprecedented levels of capital to drive change in those countries and industries bearing the greatest responsibility for modern slavery today."[61] The founders are seeking to create a social movement and engage businesses to eliminate slavery. Thus, like the WJP, it is an example of what has been called *philanthrocapitalism*: a reform effort by leaders in business.

While Bales used case studies of particular economic activities as well as other reports to count slaves, the Global Slavery Index is vague about the range of materials it uses. The website says that the data come from two types of research: (1) secondary collection of government reports, journalistic reports,

academic reports, and NGO or international organization publications, and (2) random sampling surveys combined with data gleaned from firsthand accounts of individuals regarding contexts of trafficking. The data are ranked by country to estimate the *prevalence* of slavery as well as a country-by-country estimate of the *size* of the modern slavery problem in terms of risk of modern slavery.

Bales says that ideal technique for collecting data on the prevalence of slavery is the representative sample survey, in which a population chosen to represent the entire population is asked about their experiences of slavery. Although there were initially very few surveys, so numbers were quite speculative, the Global Slavery Index report has developed its methodology over time. In 2018 it measured forced labor and forced marriage through 54 surveys of 71,000 people in 48 countries as well as on the basis of administrative data from the International Organization of Migration and the International Labour Organization.[62] Country-level assessments of risk factors for modern slavery based on variables such as gender, age, marital status were used to estimate prevalence for 147 countries which had data deemed relevant to estimating risk factors. Combined with population numbers, this approach produced prevalence estimates, to which were added data for state-imposed forced labor. Despite considerable improvement in methodology and data collection, much of this data analysis involves drawing inferences from the limited data available, which the report acknowledges.

Producing good quantitative knowledge about slavery is clearly challenging and expensive. Given the enormous difficulties of locating and identifying people who could be designated as slaves and the importance of taking the social context into account in defining their status as slaves, it seems virtually impossible to accurately determine how many people live in slave-like conditions. To develop comparable data, it is necessary to identify core features that all of those so identified share and to extract this core from the overarching context. As Bales notes, "Finding measurable variables is difficult with a phenomenon like slavery, which has an essential core but varies dramatically from place to place (and from time to time)."[63] He defines the essential core as three factors: the use of violence to control the person, the resulting loss of free will, and economic exploitation so that normally the person receives no compensation for his or her work.[64]

Nevertheless, the Global Slavery Index provides approximate numbers for the number of slaves in almost all the countries of the world and ranks all the countries it examines in terms of prevalence, vulnerability of population to slavery, and government response. For example, the two countries with the worst record are North Korea, with 2,640,000 slaves, or 104.56 per 1,000

population, and Eritrea, with 451,000 slaves, and or 93.03 slaves per 1,000 residents. At the other end, among the best countries are Iceland, with no slaves, and Norway, with an estimate of 9,000 slaves and a ratio of slaves to population of 1.81 per 1,000.[65] The index's definition of modern-day slavery includes private forced labor exploitation, state-imposed forced labor, forced sexual exploitation of adults, and commercial sexual exploitation of children.[66] Yet, according to Bales's definition, determining whether or not a person counts as a slave within particular local circumstances requires knowing whether the person's situation, understood within a network of social and economic relationships and power differentials, fits the category of *slave*. Carrying out a survey of any size is enormously expensive, and finding a way to count people in illegal statuses requires careful and long-term research. Bales assures us that it is common in sociology to convert difficult-to-measure phenomena into measures that can be manipulated statistically.[67] He describes his methods in the past as poring through UN reports, International Labour Organization reports, the U.S. State Department's *Country Reports on Human Rights Practices,* the U.S. *TIP Report*, meetings of the UN Working Group on Contemporary Forms of Slavery, NGO reports, government reports, academic studies, and press reports, which he says are by far the largest source of information on labor abuses.[68] He collected all the numbers, estimates, and guesses for each country and assembled what he refers to as a "great hodge-podge."[69] As he developed estimates, he consulted experts on the country, region, or industry (to whom he promised anonymity) to advise him about whether these estimates were too high or too low. The result was his widely circulated estimate of 27 million slaves in the world,[70] initially proposed in 1999 and raised to 29.8 million slaves in the 2013 Global Slavery Index and to 40.3 million in 2016, the latter being the most recent figure as reported in the 2018 Global Slavery Index.[71]

Although Bales clearly acknowledges the flaws in his data, the need for more and better information, including information on the qualitative texture of slavery, and the fact that the nature of slavery has changed with demographic and economic change,[72] he has nevertheless helped to produce a set of numbers that is highly specific. These numbers, portrayed in the index, make the existence of slavery knowable and its distribution clear. The measurement system defines and fixes the object, the modern-day slave, and locates it regionally. Thus, the act of counting and its representation in colorful, interactive maps, despite its speculative basis, creates the figure of the modern-day slave and forms the basis for a modern-day social movement. Nevertheless, given the obstacles to defining who is in practice a slave and locating such people, it is highly likely that the numbers are at best inaccurate

and possibly also misleading. As in the other examples, a project that begins as a reform ends up creating a form of knowledge that is potentially highly misleading and, again, targets global South states that are defined as having large populations of slaves. At the same time, the focus on this particular status of controlled worker draws attention to this violation while distracting attention from the far larger population of underpaid, exploited workers who are fully integrated into the global market economy. While some people are defined as slaves who deserve rescue, these other workers are normalized.

Conclusions

In what way can quantification be seen as a roboprocess, a mechanism of control that is naturalized and escapes explicit critique as a mode of power? These case studies suggest six dimensions of quantification that can be interpreted this way.

First, indexes and ranks create knowledge that appears objective and scientific, in part because the precision of numbers themselves lends scientific authority to their claims. Yet, these ranks and indexes are made up of categories for counting and theories of how things should work that are typically unstated: they embody assumptions about what constitutes a good university, what should count as economic growth, and who is a slave who needs to be liberated rather than simply a person in a miserable job. There is power in the hands of those who create the categories, decide what to measure, evaluate vague data, and convert it into unambiguous numbers. As the examples show, these efforts reinforce ideas about what matters in economic productivity, good universities, and in creating a rule-of-law state. They influence which school a student attends, which countries appear to be doing well economically, and which ones can claim the status of good governance and little slavery. Yet, the power to construct categories and populate them with data is rarely recognized, nor are the underlying theories of social life explicit.

A second feature of the power of quantification is the way it highlights some kinds of information and excludes others. The focus on what can be counted and what has already been counted leaves many important issues out, such as the social climate of a school, the contribution of natural resources to GDP, or the array of social conditions within which a person becomes caught in a slave-like condition.

A third feature is that the demands of making data commensurable so that comparisons can be drawn among schools or countries means that quantification can only take place on the basis of shared standards. Recognition of a diversity of standards for schools, a variety of forms of unfree labor, or

variations in how a society should be governed cannot be included in the calculations. Indeed, quantified representations cannot consider the context of the things counted even though such contexts are deeply significant for understanding events as diverse as test taking or becoming enslaved.

A fourth feature of the turn to quantification is its compatibility with a marketized, neoliberal conception of society. As philanthrocapitalists—business leaders with substantial access to private funding—become more involved in development and social reform activities, they bring to the project enthusiasm for quantitative evaluation of success and technocratic approaches to social change. It is not surprising that in three of the four case studies, wealthy private actors played a central role in developing the indexes. As the study of GDP indicated, its focus on the market itself rather than the larger context of economic activity excludes some of the costs of that activity, such as the damage to the environment. Clearly, the rule-of-law indicator embodies a particular notion of good governance, based in the global North. The educational ranking system rewards a particular vision of education, also located in the global North, and promotes the branding of educational institutions within a market for educational services. Thus, these systems of quantification subtly endow Northern institutions with superior status and pressure Southern ones to follow suit, not explicitly but simply through establishing standards and evaluating countries according to these standards.

A fifth feature of the turn to quantification is the demand for specific numbers. Producing these numbers entails considerable cost and, in the absence of sufficient funding, can produce missing or even misleading data. At the same time, the conversion of broad social phenomena into numbers fosters a false specificity, allowing a comparison among countries that differ in many significant ways that are not encompassed by the numbers. The number of slaves in each of 167 countries, for example, cannot be anything but speculative given the very limited data and the ambiguity and illegality of the concept of "slave." Yet, the index confidently offers specific numbers or ranges of numbers with little indication of the source of these numbers, although its willingness to provide estimates rather than precise figures has increased over time. Bad data and false data can lead to bad decisions.

Sixth and finally, the growing reliance on data for governance raises enormous questions of cost and the value of investing in counting in comparison with other activities. Clearly, this is a greater problem for poor countries than rich ones, but even in the school ranking system, schools are compelled to devote resources to tending their rank that they would rather use for other activities. The act of counting itself absorbs scarce resources in the name of reform, promoting a more rational social order and pushing for a more

standardized political, legal, economic, and educational order. The focus on slavery represents another dimension of this pressure. At the same time, this technology serves to foster an economistic, marketized vision of society. Given the goal of uncovering and exposing relations of power where they remain veiled—here as they are hidden by claims of science, objectivity, and rationality—it is critical to interrogate the burgeoning turn to measurement both as a mode of knowledge production and a dimension of governance. We may not like where it is taking us.

AFTERWORD

Remaking the World

CATHERINE BESTEMAN

On December 2, 2013, Rahinah Ibrahim won her lawsuit against the U.S. government over its refusal to remove her name from the No Fly list of terrorist suspects. She also asked to be told the reason for her listing and to have her student visa reinstated so she could return to Stanford University from Malaysia. This was the first trial to challenge the terrorism watch lists assembled and maintained by U.S. government agencies, and even though the court ruled that she was flagged by accident, she was not allowed to see the evidence against her. In a later lawsuit brought by the American Civil Liberties Union (ACLU) on behalf of thirteen U.S. citizens and permanent residents on the No Fly list, the court ruled in 2015 that the U.S. government had to offer some reason for their listing to the plaintiffs, but it left them without an avenue for overturning their placement. As of March 2018, the ACLU was contesting the refusal by the government to offer a constitutionally based method of redress for those placed on the list.[1]

Even though there are an estimated million names on terrorism watch lists, including tens of thousands on the No Fly list alone, the U.S. government is still not obligated to reveal the particulars of why someone has been flagged, nor is it possible to contest one's placement without extraordinary and heroic measures such as costly lawsuits. (Nelson Mandela was only removed from the U.S. terrorism watch list in 2008, a decade and a half after shepherding South Africa's nonviolent transition to democracy, winning the first democratic South African Presidential election, and receiving the Nobel Peace Prize.[2]) Watch lists are shared among government agencies, enlarging the consequences of finding oneself on the list—beyond the not insignificant inconvenience of being questioned and possibly detained at airports—to affect interactions with police, potential employers, and more. Because names end up on terrorism watch

lists through data mining on social media sites as well as through nominations (only 1 percent of which were rejected in the early to mid-2010s), the range of those included is extraordinarily broad, stretching from small children such as toddler Mikey Hicks, to politicians such as U.S. Senator Ted Kennedy and Bolivian President Evo Morales,[3] to activists and artists such as Yusuf Islam, the singer formerly known as Cat Stevens. The installation artist Hasan Elahi responded to his placement on the list by chronicling the minute and intimate details of his life online, in a parody of the surveillance state (described in his 2011 TedTalk).[4] In particularly horrifying cases, some people, including American and Canadian citizens, have been incorrectly targeted, detained at airports, incarcerated, tortured, and publicly humiliated for months before it was determined that they were innocent of terrorist associations.[5]

Just as the nomination and data mining practices that put names on security watchlists contain errors and misinformation with life-changing consequences, the same is true for the impact of incorrect credit reports. A 2013 Federal Trade Commission report found that one in five people surveyed identified errors in their credit reports, with one in twenty—which would amount to ten million people when scaled to the total U.S. population—finding errors that were serious enough to reduce their credit score. As with No Fly and terrorism watch lists, it is almost impossible to successfully dispute an incorrect credit rating.[6] And, as Cathy O'Neil explains in her book *Weapons of Math Destruction*, because credit scores might be used by employers to determine who they think might be a responsible employee, the scores can discriminate against those with poorer scores without attention to the factors affecting those scores.[7] Thus, she argues, those with lower scores have a harder time finding employment, which makes their efforts to manage their credit harder, while employers miss out on potentially good employees. And in those states that forbid employers from using credit scores to assess potential employees, employers now use e-scores derived from data mining by private consultants. These are like FICO Scores but tailored to the company's interest. Call centers use them to direct callers to a robot or to a live human operator, based on their credit and purchase history, for example. "The existence of these e-scores shouldn't be surprising," O'Neil writes. "We've seen models feeding on similar data when targeting us for predatory loans or weighing the odds that we might steal a car. For better or worse, they've guided us to school (or jail) and toward a job, and then they've optimized us inside the workplace. Now that it might be time to buy a house or car, it's only natural that financial models would mine the same trove of data to size us up."[8]

Like the examples provided in previous chapters, No Fly lists, terrorism watch lists and credit scores are additional illustrations of roboprocesses that

categorize people on the basis of data that may be flimsy or erroneous but that may be applied without accountability or transparency. Should this matter? One might argue that things like No Fly lists and incorrect credit reports are a small price to pay for the public benefits of security and easier access to credit. Are roboprocesses just another step forward, albeit with a few new wrinkles, in the modernist project of streamlining economic and social processes, enhancing efficiencies, growing capitalist production, and enabling better government? The chapters in this book suggest that such a blithe assessment would be wrong. In what follows, this afterword identifies some features of contemporary roboprocesses that distinguish them from modernity's previous forms of social ordering and production and suggests what might be at stake in a world managed through roboprocesses.

What's New about Roboprocesses

The foregoing chapters describe how quantification and automation are the basis of algorithmic ordering systems. *Quantification* is the process through which context and information are reduced to a single number, which can then be used to evaluate, score, or rank (mortgages, test scores, global indicators, criminal adjudication) and to homogenize, regularize, and expand an activity (porcine production, consumer purchasing, data harvesting). As we have seen, algorithms are created to automate and animate these processes: to generate self-perpetuating, robotically machinelike ways of gathering, sorting, and ordering data; managing social life; and directing productive activity. Some algorithms originated from progressive impulses and as solutions to problems: to streamline services, reduce human error, hold everyone to a single standard, and make systems fairer and more equitable by eliminating human bias. By forcing teachers, mortgage brokers, or judges to apply uniform standards of assessment, then school success, bank loan practices, and criminal sentences should be comparable across lines of class, race, gender, and geography. Thus, with the goals of measurement, standardization, commensurability, and error reduction, the current age of algorithms could be seen as simply a continuation of other instantiations of modernity, such as mechanization, industrialization, Fordism, and some types of bureaucratization that also relied on automated systems of production and rationalist efforts to forge conformity.

Certainly, the hope to ensure that all schools offer quality education, to deliver equitable sentences for criminal offenses, to expand access to online information for people everywhere in the world, or to hold countries across the globe accountable for battling corruption or protecting human rights sound like laudable goals. But, as we have seen, roboprocesses are subject

to the same sorts of possibilities for human error and bias as nonautomated decision structures are. Schools falsify test scores, racist policing practices bring proportionally more people of color than whites into the judicial system, racist lawmakers enact harsher drug penalties for substances used more frequently by people of color than by white people, surveillance data monitoring systems misidentify innocent targets for automated killing by drones, global indicators are built from nonexistent or made-up data.

But even though roboprocesses are subject to errors just as the automated or bureaucratized systems of earlier eras were, the possibility of error or bias is not the most significant aspect of how roboprocesses are remaking our world. The failures of roboprocesses—the ways in which they produce terrible or stupid outcomes, do not make systemic improvements, spread misinformation, and damage people's lives—offer indications of how the age of algorithms is distinct from previous iterations of modernity. As automated systems that generate and evaluate data, their reach penetrates far beyond the restructuring of the workplace and the disciplining of workers by company managers, and their effects go far beyond worries about "McDonaldization."[9] The emerging assemblages of authoritarian control and profitability they enable in the absence of accountability carry enormous new implications for the practice of democracy, the structuring of daily encounters with corporations and the state, and the basis of contemporary and future social life. Roboprocesses represent a revolution in the ordering, control, surveillance, and profit-making realms of social management because of several key features: they are opaque and difficult to comprehend; those who write and deploy them are not accountable for their effects; they are secret; they do not require consent from those from whom they gather information; they offer little ability for contestation or nonparticipation; and the scale on which they operate can be massive.

In his 2015 book *The Black Box Society*, Frank Pasquale, one of the most astute analysts of the social impact of algorithms, argues that reforms for greater transparency in banking, corporate, and government regulations and practices instituted after the economic crash of 1929 have now been reversed by neoliberals, who want corporate secrecy and deregulation in order to enhance profitability, and by neoconservatives, who, citing the threat of terrorism, want to allow the government to conduct affairs secretly and to tighten surveillance and social control.[10] The result is the exposure of citizens to ever-expanding surveillance by corporations, banks, and the government. These entities often work in tandem and rely on secrecy, obfuscation, and, sometimes, intentional deception through enshrouding their algorithmic practices in enormous complexity to make them difficult to access and understand. People literally do not know what corporations, banks, and the government

are doing with the data they collect, how those data are being collected, and how they are being used.

This matters, Pasquale writes, "because authority is increasingly expressed algorithmically. Decisions that used to be based on human reflection are now made automatically. Software encodes thousands of rules and instructions computed in a fraction of a second."[11] He acknowledges that "such processes have long guided our planes, run the physical backbone of the Internet, and interpreted our GPSes",[12] but when applied to things like school rankings, credit reports, No Fly lists, and deportation cases, those on whom they have an impact are unaware of how the rankings were determined, what values are being used to write the algorithms, what choices were made about what to privilege, and how to contest the outcomes.

Harvard business professor Shoshana Zuboff, who has spent years studying the "digital titans" Google, Facebook, Amazon, and others, argues that these oligopolies have engineered a "coup from above: not a coup d'etat, but rather a coup des gens, an overthrow of the people's sovereignty," through figuring out how to gain and profit from unprecedented access to freely provided information by internet users.[13] After Google developed an algorithm that became the world's most successful search engine, its leaders used this capability to engineer a wholly new genus of capitalism that Zuboff calls "surveillance capitalism." Surveillance capitalism has spawned ever-increasing ways of obtaining information about people without their knowledge or consent, from harvesting the scads of personal data that people unknowingly leave behind on the internet, to the vast array of "smart" devices that have turned the home into a set of data sources streaming information about everything from utility use to exercise patterns, to the conversion of public spaces into zones of surveillance through technologies that capture activities. These data are sold for profit, provided to governments outside the restrictions on government surveillance imposed by law, used to shape behavior through rewards and penalties, and marketized to predict future behavior. The effort by the data-mining firm Cambridge Analytica to influence the 2016 U.S. election by utilizing the personal data of as many as eighty-seven million Facebook users that it secretly obtained is just one particularly flagrant example.

Writing before the scope of Cambridge Analytica's actions were known, Zuboff saw the transformation wrought by surveillance capitalism as nothing short of revolutionary:

> The assault on behavioral data is so sweeping that it can no longer be circumscribed by the concept of privacy and its contests. This is a different kind of challenge now, one that threatens the existential and political canon of the

> modern liberal order defined by principles of self-determination that have been centuries, even millennia, in the making. I am thinking of matters that include, but are not limited to, the sanctity of the individual and the ideals of social equality; the development of identity, autonomy, and moral reasoning; the integrity of contract, the freedom that accrues to the making and fulfilling of promises; norms and rules of collective agreement; the functions of market democracy; the political integrity of societies; and the future of democratic sovereignty.[14]

Pasquale minces no words in his condemnation of the use of algorithms in finance to generate profit while evading responsibility for poor outcomes. He argues that with the advent of *high-frequency trading* (in which trading is automated by computers that use complex algorithms to analyze multiple markets), extremely complicated and opaque algorithms can produce destabilizing outcomes that are completely unlinked from value because they are programmed to predict stock market sales and buys through scavenging information to initiate fast trades to beat out competitors. The algorithms are not programmed to measure the actual value of anything but rather to figure out where profit can most likely be made. The algorithmic trading of such things as credit default swaps is betting on risk. One company buys up mortgages as well as insurance for those purchases in case of defaults. Both companies develop algorithms to predict financial gain from their practices (buying mortgage debt, selling insurance). Everyone expects to make money. But when defaults happen, the system collapses. Algorithms, Pasquale suggests, were programmed to tell only positive stories of financial gains predicted from gambling with risk, but not losses. If numbers from the algorithms predicted losses, the algorithms were rewritten. Pasquale's argument is not that algorithms in the financial industry are good or bad but rather that they are highly manipulable, often secret, and often so complex that they are impossible to understand and thus regulate. Hence they pose a not insignificant risk to the stability of the overall financial system.[15]

In addition to the lack of transparency, accountability, and consent and the reliance on secrecy, two other critical features of algorithmically based systems of quantification, ordering, and automation are their massive reach and that they offer few opportunities for contestation, appeal, negotiation, or refusal. As O'Neil says, "You cannot appeal to a WMD [which stands for "weapons of math destruction," her term for algorithms]. That's part of their fearsome power. They do not listen. Nor do they bend. They're deaf not only to charms, threats, and cajoling but also to logic—even when there is good reason to question the data that feeds their conclusions."[16] Roboprocesses can become automated mechanisms of authoritarian control, deployed in fundamentally

antidemocratic ways. Algorithms fuel the spreading security state of ubiquitous surveillance and the neoliberal drive toward profitability above all else. Algorithms link new technologies with new kinds of data sets and automate interactions that previously allowed a space for human judgment and common sense, allowing the application of algorithmic assessments, measures, and ordering protocols to shape society like never before. The connection of everyday objects to the internet as data sources makes citizens into data generators, targetable by commercial profit seekers and surveillance mechanisms without the citizens' knowledge or consent, enmeshing the public and the private to a greater extent than ever before. When algorithms make people foreclosable, deportable, killable by drones, or permanently censured as felons, and when those so labeled are denied access to the information on which these assessments were based, blocked from contesting incorrect or misleading data, or refused the opportunity for a reconsideration of their status, the fundamental basis of democratic society has been utterly comprised. The extensive reach of roboprocesses, their failures, and most specifically the inability to challenge or correct absurd or harmful outcomes reveal their novelty and their power.

Who Benefits from the Algorithm Society?

But roboprocesses would not exist if they were uniformly harmful, of course. Although roboprocesses can and do produce ridiculous and damaging outcomes, they also offer enormous benefits to those who control and apply them because algorithms can be used to maximize profitability, ensure deniability, and dilute culpability.

The previous chapters name some of the beneficiaries of algorithmic management regimes. During the 2008 economic crisis, Noelle Stout in chapter 1 shows that the beneficiaries of banking algorithms were not those who held risky mortgages. Underwriting algorithms were used to push people into accepting risky or unnecessary mortgages, and then when the market crashed, new algorithms were adopted to enact foreclosures, resulting in millions of people losing their homes when they should have qualified for mortgage assistance. Foreclosures were managed by computerized systems more than by human reviewers because profit-seeking corporations chose not to invest in staff, leading to massive, widespread errors in data collection and the robosigning of foreclosure documents without review as a matter of course. The algorithms used to determine whether someone qualified for mortgage relief were written to determine if it would be more profitable to the company to foreclose or to modify payments, not to assist indebted homeowners in managing their loan payments.

In public education, Ann Lutz Fernandez and Catherine Lutz in chapter 2 show that it is not teachers (they are being disciplined and deskilled), and it is not students (they have been turned into unpaid little test takers). If anyone benefits from standardized robotesting regimes in schools, it is the corporations that profit from creating and managing the testing regime and selling the textbooks and teaching scripts that teach to their tests, and the politicians who take their donations and hawk their products. Jill Koyama, an anthropologist who has studied the impact on New York City public schools of No Child Left Behind, agrees: "NCLB's standardization, privatization, and marketization encourage local policy actors to become complicit in standardizing and quantifying academic assessment through their reliance on services and products marketed to schools and districts that are not meeting academic benchmarks. These services, mostly offered by for-profit vendors, help keep schools in compliance with policy requirements, but replace a focus on student learning with the production, management, and sometimes the fabrication, of data."[17]

Susan J. Terrio's chapter 3 on robodeportation shows it is not detained children who benefit from being brought into the legal system, because the numerical rankings assigned to determine deportability are written to prioritize the denial of legal status to undocumented children rather than to ensure their protection and are written in such a way as to exclude nuanced, contextual judgments about individual children. Detained children who have fled dangerous environments in their home countries are assessed without the benefit of legal representation so they can be either deported or fast-tracked through "rocket-docket" processing to be released without legal relief. Lurking in the background is the profitability of the U.S. deportation regime for the network of private contractors who run detention centers where deportable children are kept while undergoing processing.

Elsewhere in the U.S. legal system, Keesha M. Middlemass in chapter 4 argues that politicians benefit from appearing to be tough on crime by passing laws and enacting policies that deny felons access to opportunities and possibilities to lead a legal, crime-free life after prison. Tough-on-crime laws that include provisions to deny felons access to programs now often rely on the use of automated criminal background checks across many social domains to identify and reject applicants with a felony record, making felons the new category of untouchables: people permanently unable to access housing, jobs, education, social welfare programs, and more. And because of racial bias in policing and sentencing laws, the population most affected is that of African American and Latino men.

Alex Blanchette in chapter 5 shows the grave physical damage to pigs of subjecting their reproduction to algorithmic management in the name of en-

hanced profitability by industrial agribusiness. While company profits grow, factory farmworkers are left to manage the sickening outcome of algorithmically driven reproduction by caring for runted deformed pigs.[18] Whereas Blanchette directs our attention to the emotional consequences on workers of algorithmically derived models of profitability, Robert W. Gehl in chapter 6 turns our attention toward the profitability of using algorithms to shape the emotions of internet users to extract personal information from them that can be used to direct their consumption patterns and enhance sales. Although consumption has long been driven by the commercial management of desire, the astonishing volume of information people provide about themselves online, for free, allows internet companies to turn that information into enormous profits while remaining protected from claims of discrimination or defamation.

Chapter 7 by Joseph Masco offers a look at how the new technological ability to collect personal information feeds the counterterrorism state's drive toward ubiquitous surveillance. "Fusion centers" are one node in the new era of data management; they combine information provided by private companies with information obtained through government surveillance to create dossiers on people that contain everything from driving patterns to utility bills. Masco surmises that predictive power may be one goal. As just one example, Valerie Strauss reports in the *Washington Post* on the vast amount of data collected on children in the United States.[19] In 2005, ten organizations began collaborating, with support of the Gates Foundation, on the Data Quality Campaign to collect longitudinal data on children in every state from birth onward. The data collected include medical information, criminal justice information, health and child services department data, survey data, and other information, which is incorporated into a database called Student Longitudinal Data Systems (SLDS). These data can be shared with vendors, governmental agencies, and researchers without the need for informed consent by the child or the child's family. SLDS is aligned with another system, called Common Education Data Standards, run by the U.S. Department of Education, which includes information about disciplinary records, counseling interventions, involvement in the juvenile justice system, and more. There is no confidentiality, there are no temporal limits on how long the data can be kept, and parents have no right to "opt out" their children from data collection by public schools. Other than those who make money from an expanded security state, the beneficiaries here are somewhat harder to identify because the future uses of the monumental amount of personal data collected in fusion centers, SLDS, and other government agencies is unclear. There is no way to predict how this information might be used in the future, which is truly frightening.

Finally, Sally Engle Merry in chapter 8 deftly explains how the indicators developed to measure and compare a wide variety of things empower an economistic assessment of social complexity and by design or by default promote values based in the global North. Such indicators reinforce already existing hierarchies, as in educational rankings, and enable privately funded entities based in the global North to exert pressure on countries based in the global South to conform to the particular conceptions of law, norms, and standards that reflect preferences of governments in the global North.

Implications

In the introduction to this volume, Hugh Gusterson identifies six key features of roboprocesses: they deskill, extract wealth, make possible new forms of wealth and power, mandate conformity and standardization, reshape people and relationships, and, in response to their power, induce irrational or dysfunctional behaviors. The chapters in this volume reveal the consequences, which I summarize here in the concluding six points.

One outcome of roboprocesses is *zombification*, the result of deskilling and disciplining. The zombie, resurgent in American popular culture, is the iconic brainless, robotic, soulless nonhuman (or posthuman). Extrapolating from the monotonous world of repetitive taskwork to the world of policy, *New York Times* columnist Paul Krugman warns of the zombification of contemporary life, in which political leaders continue to rely on "zombie lies" and "zombie ideas," policy ideas whose efficacy is denied by evidence but who refuse to die and cannot be killed, such as free-market fundamentalism ("zombie economics"), or, more specifically, the idea that tax cuts for the rich spur economic growth.[20] With the marketization of daily life enabled by algorithmic domination, numbers can be used to obscure and stupefy and algorithms can be deployed to tell us whom to listen to, what to buy, how to think. Zombification degrades critical thinking and the ability to imagine alternatives.

Roboprocesses also spur the zombification of interpersonal relationships—the robotic click of the Like button as a replacement for discussion and debate, the relentless barrage of commercial pop-up ads that track networks among internet users so as to turn personal relationships into marketing opportunities, the use of programmable robopets as companions for the elderly who are abandoned in nursing homes by other living people. Writing about efforts to design programmable robots whose algorithms can be individually tailored to make them totally compliant, undemanding, and responsive to their human companions, Sherry Turkle worries that the result will make us less human, less resilient, less tolerant, less flexible, less alive: "just as we

imagine things as people, we invent ways of being with people that turn them into something close to things."[21]

The algorithms employed by medical insurance companies to shape doctor–patient visits seem to be doing just that. The mandated fifteen-minute time limit allotted per visit by insurance companies means that doctors don't have time to listen to their patients and must prioritize figuring out how to translate symptoms into a predetermined code provided by the insurance company. One journalist describes an office visit in which a patient seeking treatment for back pain reveals to his doctor in the thirteenth minute of the appointment that he is divorcing and that the divorce proceedings and child custody hearings are going badly.[22] The doctor is left less than two minutes to process, respond to, and diagnose this aspect of his patient's health. In doctors' offices today, a recent report shows, "the average number of empathic utterances per visit is one."[23] The fifteen-minute visit reduces every symptom to a code that can be entered into a computer and, often, turned into profit through the hurried solution of medication.

Zombification by algorithm is what happens when algorithms program policy and structure social interaction rather than the other way around. Zombie algorithms, like zombie ideas, take on a life of their own, seemingly no longer tethered to human control or oversight, becoming ends in and of themselves—robotesting, roboforeclosures, robosurveillance, robomedicine—even when outcomes are bad.

A second outcome of the algorithmic society is that participatory, informed citizens are turned into consumer-subjects when they become data sources for wealth extraction via the internet, their smart devices and home appliances, and surveillance technology (such as automated traffic cameras). Since we give companies unprecedented access to our personal information through our devices, *New York Times* reporter Jacob Silverman suggests that we are really just renting these devices because their software is proprietary and remains under the control of the company, not the consumer: "At its most expansive, 'smart' produces a world where we no longer exert control over objects we've bought from corporations, but corporations exert control over us through things we pay for the privilege of using."[24] He also notes that while infrastructure and social support programs are falling apart, cities are investing in smart technology that privatizes public space, such as through Wi-Fi hubs that require consumers to provide personal information to gain access. Investment in smart technology that collects information about people for marketing purposes is very different from investing in programs that provide social support. The result is the shrinking of democratically accessible public space and the withering of democratically run social institutions.

A third outcome, the proliferation of secrecy as the new norm, underwrites the rise of new institutions of wealth and power that are opaque to citizens, or consumer-subjects. We are experiencing a wholesale transformation in our definition and expectations of privacy. Ubiquitous surveillance, the sale by technoentrepreneurs of personal information, and the lack of accountability for what happens to that information is transmogrifying liberal constitutionally based understandings of the public–private divide. In turn, we endure vulnerability to hackers of corporate and government websites who get our Social Security numbers, credit card numbers, and more. We are in uncharted legal territory where there is no accountability for how the data held in fusion centers or by Silicon Valley firms may be used in the future. Similarly, the new class of philanthrocapitalists whose private wealth was built partly on their control over the personal information collected from others are engaging in projects of social engineering throughout the world that are not subject to democratic process or accountability, such as when tech billionaires create their own foundations to engineer projects on health care or education. They are what Pasquale calls "technolibertarians"[25] in two senses: they gain their wealth from proprietary algorithms that remain largely unregulated, and their resources are so great that they can bypass governments and democratic processes to enact programs of their own design and preferences around the world.[26]

A fourth outcome of roboprocesses is their ability to amplify and naturalize inequalities and identities, one aspect of conformity and standardization. An example is the new popularity of DNA testing by companies that use algorithms built on minute and manipulable data sets to assign people ancestral racial, ethnic, or national memberships. Their claim to "scientific verification" implies that the racial and ethnic ancestral groups they identify are biologically based and quantitatively knowable through DNA testing—claims that have the effect of reinscribing race.

Even more disturbing are the ways in which algorithms can produce racist outcomes. In a well-known study, Harvard professor Latanya Sweeney found that online Google and Reuters searches for a "black-identifying name" prompted a significantly higher frequency of pop-up ads with the word *arrest*, implying the person had a criminal record, than did searches using a "white identifying name," regardless of whether the company database for the names actually included criminal arrest records (the highest percentage of ads implying criminality popped up in searches for "DeShawn," "Darnell," and "Jermaine," while the names "Jill" and "Emma" produced the highest percentage of neutral ads with no implication of arrest).[27] The potentially negative impact on employers, colleagues, business associates, and new acquaintances is

just one consequence.[28] Sweeney's study showed that ad delivery is racially discriminatory, but because the algorithms used to determine which ads will pop up for which users are both proprietary and responsive to the online activities of individual internet search users, it is impossible to determine whether algorithms are racist through human creation or only become so through the racist online practices of users.[29]

Another disturbing study discovered that a common software developed by a for-profit company and used to predict whether defendants were likely to commit future crimes wrongly identified black defendants as likely future criminals twice as often as white defendants, and misidentified white defendants as being at low risk for recidivism more often than black defendants.[30] In real life, the results of the algorithmically determined predictions are used at every step of the judicial process, from setting bonds to parole. As with racially-linked pop-up ads, who is at fault is difficult to determine. Legal scholars are currently debating whether or not algorithms can be racist, and if they are, how that finding should be adjudicated. An algorithm cannot be sued, and its authors can deny responsibility for how it is employed in practice.

The fifth outcome of life in an algorithmic society is how the remaking of persons and relationships is giving rise to the emergence of what Pasquale calls "the algorithmic self."[31] In an algorithmic society, people learn to align their behavior with ranking systems to achieve higher rankings, respond with compliant self-monitoring to surveillance algorithms that record dissenting behavior or behavior that departs from the norm, and invest in social media sites that encourage self-evaluation through algorithms that feed people information about themselves (the sort of products they should like, people they should friend, news they should read, and so forth). Everyone is engaged in "algorithmic self-making," a process Pasquale warns has become normalized and pervasive in all domains of life, from romance to mental health.[32] Echoing Turkle's concerns about robocompanions, Pasquale writes, "As we are treated algorithmically (i.e., as a set of data points subject to pattern recognition engines), we are conditioned to treat others similarly."[33] The social credit score in China described in this book's introduction, where one's access to services and benefits varies according to the social score they earn from ratings by those with whom they come into contact, is but one possible future for a society made up of algorithmic selves.[34] The algorithmic self as a set of data points to be mined is reminiscent of Wendy Brown's fears about the creation of *homo oeconomicus,* entrepreneurial selves detached from democratic citizenship that self-constitute through search engines to appear attractive to potential "investors," such as employers, sexual partners, friends, and more.[35]

As a result, Turkle, Pasquale, Brown, Botsman, and many others envision a future stripped of democratic participation and dissent, oriented only toward the goals of profit maximization for the few.

Natasha Schüll's research on the marketing and use of wearable smart devices to monitor health and lifestyle activities offers an example of how the algorithmic self is also the regulated self.[36] She tracks how such devices—which range from an "idle alert" that vibrates when its wearer has been sitting for too long, to the HAPIfork that vibrates if the user is eating too quickly, to hydration devices that flash when the user has not been drinking sufficient amounts of water—encourage self-regulation through "digitally assisted self-care" models imposed by wearables.[37] The devices digitally "nudge" their wearers to comply with algorithmically determined healthy living practices. These and scads of other devices teach users that the self can be understood as a data streaming entity to be managed through technologically mediated regulation. Self-management is outsourced to technology; choice becomes compliance.

Conclusion

In addition to the frequency of perverse, racist, discriminatory, and harmful effects of algorithms we have encountered throughout this book, the dysfunctional responses to algorithmic domination reported here—cheating, gaming the system, flipping the bird at surveillance cameras, and making up data for rankings assessments—point to a growing need to reckon with the outcomes wrought by algorithms. For critics like Pasquale, algorithmic reform must proceed through measures to crack open the black box to expose algorithms for public scrutiny and regulation. Because algorithms are used so ubiquitously in the public sphere—to determine everything from the allocation of public services, to policing patterns and practices, to parole, to teaching performance assessments, to the likelihood of recidivism for those convicted of a crime, to DNA analysis in forensic work—such algorithms *must* be opened to public debate. In December 2017, New York City became the first place in the United States to pass an "algorithmic accountability bill," which created an auditing regulatory task force to work toward algorithmic accountability for the algorithms used to shape, evaluate, and manage public life.[38]

A corollary to algorithm transparency is transparency about how personal data left on the internet by users can be mined, used, and marketed—a question of resurgent significance in the wake of the Cambridge Analytica scandal. Europe may be leading the way here: in May 2018, the twenty-eight countries of the European Union instituted a new General Data Protection

Regulation that offers privacy protections for internet users. As described by Tom Wheeler, the former chairman of the U.S. Federal Communications Commission (FCC), the new regulation "ensures that consumers own their private information and thus have the right to control its usage and that internet companies have an obligation to give consumers the tools to exercise that control. The [new] rules, for instance, require companies to provide a plain-language description of their information-gathering practices, including how the data is used, as well as have users explicitly 'opt in' to having their information collected. The rules also give consumers the right to see what information about them is being held, and the ability to have that information erased."[39] Users can ask companies that collect information about them online—from banks to loyalty programs to employers—to provide a full accounting of that information. Users have the right to then download and transfer their information to other companies along with their business, or to contest the use or collection of that information through a complaint process or even a class-action lawsuit. The new law also gives individuals "the right not to be subject to a decision" arrived at through the automated processing of data.[40]

In contrast, in the United States, President Donald Trump in 2018 signed into law a new regulation that *prohibits* the FCC from imposing privacy protections and "opt in" requirements. Wheeler optimistically suggests that the new European protocols will inevitably spill over to users in other countries as internet companies like Facebook and Google will have to enact privacy protections for European internet users, writing, "In an interconnected world where digital code doesn't respect the geographic or national borders, this will surely have a positive global impact."[41]

Opening algorithms to public scrutiny is just one component of necessary reform: in addition to transparency, oversight, and regulation to assess the algorithms deployed in the public sphere, other measures can also mitigate the potential damages caused by algorithmic decision making. At the front end, companies that employ algorithms can transform hiring and training practices by insisting on vastly greater diversity in the coding industry and ensuring that values such as nondiscrimination, antiracism, and fairness are foregrounded prior to coding. Additionally, continual and mandated algorithmic auditing to test algorithms in various and diverse contexts can figure out prior to their deployment that, for example, the algorithms in Google images would read dark-skinned people as gorillas rather than humans, or that self-driving cars might not be able to recognize people who are not white men as humans, or that an algorithm designed to predict recidivism is wrong more than 40 percent of the time.

In sum, the chapters in this book show how the rise of an algorithmic society *in its current form* anticipates the decline of democracy—of the belief that one shares a stake in a public good, that society is governed by fairness, and that dissent can be effective. While political elections may continue to be the visible mark of democratic practice, the fight for democracy in an algorithmic society will be about accountability and transparency for those who control the software and access to data, how consent is reimagined and protected, and how challenges to injustice are protected and supported.

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Introduction

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Chapter Three

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Chapter Five

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