SIGNALING EXHAUSTION AND PERFECT EXCLUSION

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You probably think of nineteenth century Great Britain as a place without any substantial social safety net aside from the Church. In fact, England had a well-developed welfare system in the nineteenth century, with local government functionaries dispensing cash. Early in the nineteenth century, low-level British functionaries knew almost all the people who were coming before them to appeal for financial assistance.[1] The local bureaucrat knew that Ms. Butler and her kids had been left destitute by Mr. Butler's death in a fire; and the same bureaucrat knew that Mr. Johnson was a drunk, someone who would immediately blow his welfare payment at the local pub. The bureaucrat could be generous to Ms. Butler and turn a deaf ear to Mr. Johnson.

By the 1830s, urbanization in England was posing new challenges to that local system for dispensing aid to the poor. In 1801, England had precisely one city with a population exceeding 100,000 people – London. But by the 1861 census, there were eleven English cities with populations exceeding 100,000, and London's population had tripled.

Now imagine the effects that urbanization would have on this welfare system. Workers from the countryside flooded the growing towns. Laborers in search of regular work might move from one village to the next. Our local bureaucrat might encounter new claimants every day, putting forth credible claims of poverty and woe. How was he to decide who was deserving and who was a swindler? How was he to ensure that the crown's limited welfare dollars were spent appropriately? One option was to refuse to give out aid to anyone the bureaucrat didn't recognize. I will say more about this strategy later, but suffice it to say that such an approach may give bureaucrats too much discretion to play favorites and collect bribes. So England didn't go in that direction.

In 1834, the British government issued a new directive. Going

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1. *See* Timothy Besley, et al., *Incentives, Information, and Welfare: England's New Poor Law* and *The Workhouse Test in* HISTORY MATTERS: ESSAYS ON ECONOMIC GROWTH, TECHNOLOGY, AND DEMOGRAPHIC CHANGE 245 (Timothy W. Guinnane et al. eds., 2003).

forward you were only eligible for government welfare if you lived in a workhouse.[2] A workhouse was basically a state-run homeless shelter. At first blush, this was a crazy strategy for the government to pursue. Running these workhouses was going to require the government to grow its bureaucracy substantially. So what explained what the government was up to? To answer that question, we'll need to know a little more about what life was like for the workhouse residents.

It was, in a word: crummy. The workhouses were bleak. They were crowded. There was no alcohol allowed. And if you were able-bodied you had to work if you wanted to be fed.[3] The only sort of people who would voluntarily agree to live in these difficult conditions, and under the state's thumb, were people with no other options.[4] For the truly destitute, such conditions were better than the alternative. But swindlers and drunks would be deterred from moving in—there were easier ways to live outside of the workhouse.

Where government officials had the same information that welfare applicants had about themselves, it was easy for the government to sort applicants into two piles—deserving and undeserving. But urbanization created an information asymmetry. Now welfare applicants had information about themselves that it would be costly and difficult for the government to obtain. The government could no longer accurately cut off the undeserving from welfare. So it created institutions that would prompt the undeserving to exclude *themselves* from welfare.[5] The British government had to grow its bureaucracy in order to achieve this strategy, but it may well have saved more by avoiding waste than it had to spend on increased labor costs.

Now consider the modern era. The pendulum that swung rapidly to the left as a result of 19th century English urbanization is swinging just as rapidly back to the right. Because of the rise of information processing technologies and the decline in privacy, we are experiencing a phenomenon that is functionally equivalent to de-urbanization. Our present society is starting to look a lot more like England in 1801 than England in 1861.

To illustrate the trend most starkly, I want to discuss a contemporary example from present-day India. Although its cities are rapidly modernizing, and its technological capacities are developing, India is still vexed by widespread poverty. Approximately 40% of its people subside on less than $1.25 per day. Rural India is particularly poor. Indian welfare is still—this will sound familiar—dispensed at the

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2. *Id.*

3. *Id.*

4. LIOR JACOB STRAHILEVITZ, INFORMATION AND EXCLUSION 80-81 (2011).

5. *Id.* at 81-82.

village level by local government functionaries.[6] When I mentioned British welfare in the nineteenth century, I flagged the strategy of refusing to dispense aid to people the government official does not personally know. That is the path that India has taken. It is quite risky for impoverished villagers to try to move to the nearest town or to another village in search of economic opportunity. The Indian villager's relationship with her local government official *is* the equivalent of her social security card.[7] In the next village over, where she is unknown, she will simply be refused aid by a beleaguered official who already has enough known local poor people to worry about. India has 600,000 villages, but many of its rural residents are effectively trapped in one of them.

The opportunities for the state to ameliorate a problem of this nature are limited. India cannot build workhouses for a *third* of its population. While private sector growth in India has been robust, there is little demand for a largely unskilled workforce in far-flung rural areas poorly served by infrastructure. India's poor need to make it to cities to have some reasonable prospect of upward mobility. Yet precisely because their social safety net is dependent on their relationships with local government officials, the nation suffers from substantial labor market dislocation.[8]

What is the world's largest democracy to do? The contemporary Indian government believes it has found a silver bullet called Aadhaar.

Aadhaar is the world's largest biometric database. Within the next several years, Indian government officials hope to include facial photographs, fingerprints, and iris scans for most of India's 1.2 billion citizens.[9] Each piece of biometric data will be linked to a name, a gender, an address, a date of birth, and a 12-digit unique identifier, something akin to American Social Security numbers. This is a very big deal in a society where the rural poor basically have no identities outside of their villages. In the words of Nandan Nilekani, the software mogul who founded Infosys and who is now building the database for the government, "what we are creating is as important as a road."[10]

A recent *New York Times* article on Aadhaar began by telling the story of Ankaji Bhai Gangar, a 49-year old subsistence farmer living in the small village of Kaldari, India. After being fingerprinted and having his iris scanned, Gangar would obtain a transportable identity for the first

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6. Lydia Polgreen, *Scanning 2.4 Billion Eyes, India Tries to Connect Poor to Growth*, N.Y. TIMES, Sept. 1, 2011, at A1, *available at* http://www.nytimes.com/2011/09/02/world/asia/02india html?pagewanted=all.

7. *See id.*

8. *Id.*

9. *Id.*

10. *Id.*

time in his life. He could now receive welfare benefits outside of Kaldari. He could obtain a cellular phone in a different village or town. He could open a bank account at a branch anywhere in India.[11] Right after Mohammed Jalil, one of Gangar's countrymen, had his iris and fingerprint scanned, he pointed at the Aadhaar computer station and told a reporter: "That will give me an identity. It will show that I am a human being, that I am alive, that I live on this planet. It will prove I am an Indian."[12] The ability of government and corporate offices to authenticate Gangar and Jalil's identities no matter where they showed up in the country would finally enable them to become full citizens in the economic life of the nation.

India's great step towards modernity is in many ways a return to England in the early nineteenth century. Every time the government interacts with one of its citizens, it will know who they are and what they are entitled to. Now this information will no longer be confined to the local functionary in Kaldari. Indian banks will know whether Gangar has made good on his debts in the past. Perhaps before too long, Indian pharmacists will know whether Jalil has filled the same prescription improperly at multiple pharmacies. And Indian police officers who pull aside Gangar during a traffic stop can determine immediately whether there are any outstanding warrants for his arrest.

In short, information technologies are combining the benefits of local knowledge (from a world of small villages, locally based bureaucrats, and minimal geographic mobility), and the benefits of modernity (the unhindered movement of labor and capital, and rights to exit underperforming communities). In such an environment, the Indian institution that seeks to exclude the unworthy or the undesirable can dispense with exclusionary amenity strategies. Indian institutions now have enough information to become effective bouncers, and every additional piece of data gives them the ability to include and exclude with greater precision.

Now let's return to contemporary America. To some degree, the changes that Aadhaar will bring to India are a transformation through which Americans have already lived. We have grown accustomed to the idea of credit scores that follow us around from city to city and vendor to vendor. The Social Security administration has little trouble re-routing its checks from Solon, Ohio to Boca Raton, Florida whenever another Buckeye retiree finally gets fed up with the winters. And with the long overdue arrival of electronic medical records, health care delivery is finally coming to resemble the other modernized sectors of the economy.

Credit card companies have long been tracking things like what

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11. *Id.*
12. *Id.*

kinds of balances we carry and how quickly we pay our bills. But they are now branching into more powerful analytics. Firms are drilling down to see what sorts of items we purchase and how those purchases predict our credit payment history. The early leader in analytics of this sort was a Canadian credit card issuer, which discovered several years ago that people who purchase felt pads to be stuck at the bottom of chair and table legs are extraordinarily creditworthy.[13] It turns out that the same sort of person who is obsessively compulsive about preventing scratches on hard wood floors is also extremely diligent about paying off her credit card balance in full every month. By aggregating data from multiple databases and geolocation services, and using data mining techniques to find whatever patterns exist, companies like Verizon and Apple can piece together consumer profiles that make FICO scores look exceptionally crude.

But the first period of the information age only sets the stage for the sort of detailed information that vendors are beginning to amass about each individual American consumer. Those of us who study privacy have come to realize that it's the *merging of divergent data sets* that provide the most useful information and that is most likely to catch consumers by surprise. Bally's has information about how often each of its members uses the gym. That seems appropriate. Blue Cross has information about how often each of its members sees the doctor. That's more sensitive, but, again, most consumers are not going to object. Now imagine Blue Cross licenses the Bally's database, to start tracking how trips to the gym are going to influence health outcomes and health care expenditures down the road. That's going to catch a lot of consumers unawares, but it is precisely the merger of these databases that might permit Blue Cross to identify counterintuitive patterns and change the way it prices risks.

The challenge for privacy scholars and people in industry, then, is to figure out ahead of time what sorts of databases may combine to produce a whole that is more revealing than the sum of its parts. Looking in our pockets and purses is one place to start.

Our GPS-enabled smartphones increasingly keep track of exactly where we go every day – how long we linger at the shopping mall, how fast we drive to work, whether we frequent the gym, the bar, or the racetrack. Although terms of service do constrain the sort of data that wireless carriers can collect, few Americans have objected to the gathering and storage of this information. Verizon Wireless recently changed the terms of its privacy policy to permit the company to sell data on its customers' geo-location, the web sites they visit on their mobile

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13. Charles Duhigg, *What Does Your Credit-Card Issuer Know About You?*, N.Y. TIMES, May 12, 2009, at MM40.

devices, and their demographic information.[14] Verizon evidently has been collecting and storing this information for some time, and they will now begin selling it in the aggregate to third parties. Consumer complaints about the policies have been muted.

Social networking web sites supplement this location information with rich data about who we know, who we speak with online, what sorts of media content we like, what sorts of games we like to play, and which celebrities we care about.

At the same time, rapid advances in facial recognition technologies and other biometrics enables firms and governments to link up online identities and databases with peoples' bodies as they move through space. Crucially, biometrics can permit peoples' behavior to be analyzed regardless of whether they know they are being scrutinized. And the combination of biometric detection with existing databases is potent. For example, thanks to Megan's Laws, facial photographs of most convicted sex offenders are already in the public domain. It is pretty straightforward to grab all of those photographs, and then link that database to video cameras running facial recognition protocols in real time, which could issue an automated alert whenever someone in a sex offender registry approaches the door of a school, day care center, or private residence. Such technologies facilitate a precise form of exclusion that would have never been possible previously.

Even as we speak, 40 police departments around the country have rolled out the Mobile Offender Recognition and Information System (MORIS). MORIS is an iPhone attachment that captures facial recognition images from anyone within five feet. It can do iris scanning too, though its range for that feature is presently less than a foot.[15] The biometric information submitted to MORIS can then be matched almost instantaneously to databases of mug shots, sex offenders, drivers license photos, passport photos, or even Flickr photographs. This is somewhat disturbing.

At the same time, there is something appealing about this type of technology—once the error rates fall to acceptable levels, then the propensity of police officers to rely on crude proxies for criminality, like race, gender, and age will dissipate. If there is a prison escapee in the neighborhood, and facial scans can be done readily on everyone, then the danger of pure racial profiling is lessened. Indeed, speaking more generally, we might expect that the modern era of databases is going to make race, gender, and age less salient than they are today. When you

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14. Jeff Gelles, *Verizon, Verizon Wireless Policy Changes Raise Privacy Issues*, PHI. INQUIRER, Oct. 20, 2011, at A26.

15. Stephanie Ebbert, *New Tool for Police is Good with Faces*, BOSTON GLOBE, July 18, 2011, at 1.

have detailed dossiers about every individual's past behavior, relying on crude group membership proxies like race or age to predict their performance as a student, worker, or neighbor will make little sense.[16]

We may, in short, enter an era in which something like perfect exclusion is possible. A store may direct its sales associates to focus their attention on individuals whose past purchasing behavior or whose social ties make them good prospects. Sales associates won't even have to ask you whether you're "just browsing." They'll already know. Banks will be able to tailor financial products to individual consumers based on profiles of their microbehavior. The idea that there are two classes of loans—prime and subprime—with limited room for negotiation will seem positively quaint. Insurance companies will get so good at data mining that they will be able to price risk for automobile policies, life insurance policies, and health insurance policies far more accurately, reducing cross-subsidies.

To be sure, information asymmetries won't entirely disappear. There will still be some spurious correlations that cause producers to mis-categorize some consumers. Some people may have such quirky tastes and behavior that even mining the largest databases will fail to spot patterns that can predict their behavior. Consumers may try to opt out of sharing information that they know is going to disadvantage them financially.

And some consumers may engage in smokescreen behavior designed to throw off the entities that are monitoring their behavior. Some consumers might buy up felt pads and then throw them away without using them—they are cheap after all. But smart algorithms might detect this subterfuge. If you buy up felt pads regularly, but then pay a contractor to refinish your floors, may God have mercy on your credit score. Similarly, people can wear sunglasses to thwart automated facial recognition software. But the economic phenomenon of *unraveling* limits the effectiveness of some of these countermeasures. Where most people have opted in to broadly sharing personal information, people may assume the worst about those who visibly opt out. To the extent that sunglasses thwart biometrics, people may begin to look at those wearing sunglasses in unsunny spaces with the same suspicion that might befall someone wearing a ski mask while entering a bank.

One effect of this reduction in the costs of sorting and exclusion is a change in the sort of signaling that people engage in. Signaling and exclusion presently go hand in hand and signaling is everywhere. Universities provide powerful signals, with many students selecting schools not so much for the education they will get there as the signal a particular degree will send to employers. Some of this signaling is

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16. *See* STRAHILEVITZ, *supra* note 4, at 113-56

expensive. And some of it is quite wasteful in the sense that the person who is using a signal genuinely possesses the quality he is trying to signal but lacks any cheaper alternative for conveying that information to the world in a credible way.

One thing signals have in common is that they are public. But in a society where so many of our consumption choices and everyday behavior are becoming decreasingly private, signaling could become a 24/7 affair. Choices like what books to buy, what places to visit, what people to correspond with, and what music to listen to were previously subject to selective disclosure. Today, you can carry around my book, *Information and Exclusion*, under your arm in an ostentatious manner so everyone will think you're an intellectual, while still going home at night to read John Grisham. All of you can buy *Information and Exclusion* online, broadcasting your good taste to the world while paying cash for Grisham's stuff at the bookstore. But soon, your Kindle or iPad might pay more attention to what documents you are actually reading, and if you are not careful, it will expose you as a fraud.

In Europe, data protection authorities have already taken aggressive measures to prevent private sector data mining, facial recognition, and data sharing across platforms. What was once a trans-Atlantic gap is becoming a trans-Atlantic chasm, and that's already making comparative privacy law a really interesting subject for academics and cross-border data transfers a lucrative practice area for lawyers. If there is anything that might make American consumers en masse shun companies that collect and sell this sort of fine grained behavioral information, the pressure of 24-7 signaling may be it. Many people do seem to enjoy their private vices and resent the idea that there should be consequences for their choices. They might be willing to be on their best behavior most of the time, but 24-7 signaling may eventually become so exhausting that people seek out avenues for returning to the private consumption choices that characterized, say, the 1980s. Much of the data that feeds the information economy is surrendered by virtue of contract law, so consumer objections or domestic voter demand for greater regulation are factors that might reverse the present trend.

Perhaps the immigration context is where we will see the most profound changes resulting from biometrics. Thanks to the United States military's extensive use of biometrics, one in every four Iraqi men of fighting age and one in every six Afghani men of fighting age have their biometric information entered in a military database.[17] This information could be used to inform decisions about who gets a visa and who gets on the no fly list, and it will be used to detain would-be entrants at our borders. The extensive use of facial recognition technology by

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17. Polgreen, *supra* note 6, at A1.

Immigration and Customs Enforcement and by several state departments of motor vehicles is already a reality.

As biometric databases of those admitted under expired visas, those previously deported, and those ineligible to enter the United States grow, American policymakers will be confronted with a politically uncomfortable challenge. Whereas it is now exceedingly difficult to identify the millions of undocumented immigrants presently residing in the United States, biometric technology can substantially reduce the costs of locating these individuals. Immigrants have to travel through public spaces to reach their places of employment, and being in those public spaces makes them vulnerable to biometric detection. Leaders of big American businesses evidently feel that the economy needs undocumented immigrants. So despite strong anti-undocumented-immigrant sentiment among many voters, business interests prevent the government from cracking down too effectively. Politicians talk about workplace raids, and new fences and higher fences and even electrified double fences, but the high costs associated with perfect immigration enforcement give the government a credible excuse for not deporting millions of undocumented immigrants. But what happens if the costs of detecting undocumented immigrants become so low that politicians can no longer rely on this excuse? Perhaps that is the point at which the government has to move toward some sort of temporary guest worker visa program.

Given the rise of linked databases and the increased precision of biometrics, there are interesting times ahead. If the social science evidence is to be believed, the increased clustering of like-minded individuals into neighborhoods, legislative districts, workplaces, and schools is likely to reduce conflict and enhance the propensity for people to participate in politics and governance.[18] Homogeneity streamlines decision-making and makes it easier to satisfy most people's preferences. Businesses with better algorithms for predicting how customers will behave are going to have happier customers and higher profits.

But there are downsides to all this homogeneity. Perfect exclusion shifts the power of choosing who is included and excluded from consumers back to producers, and the result is that people have less

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18. *See generally* Hilde Coffé, *Social Capital and Community Heterogeneity,* 91 SOCIAL INDICATORS RESEARCH 155 (2009); Barbara F. Reskin et al., *The Determinants and Consequences of Workplace Race and Sex Composition*, 25 ANNUAL REV. OF SOCIOLOGY 335 (1999); Nicholas Stephanopoulos, *Spatial Diversity,* 125 HARV. L. REV. (forthcoming 2012). On the other hand, such homogeneity may also engender various other undesirable consequences, such as increased violence, *see* Edward S. Shihadeh & Nicole Flynn, *Segregation and Crime: The Effect of Black Social Isolation on the Rates of Black Urban Violence*, 74 SOCIAL FORCES 1325 (1996), and decreased generalized trust, *see* Melissa J. Marschall & Dietlind Stolle, *Race and the City: Neighborhood Context and the Development of Generalized* Trust, 26 POL. BEHAV. 125 (2004).

opportunity to try fitting in with a different crowd, or infiltrating a club that might not want them.

Politicians and political parties are using data-mining with increasing sophistication, and this goes unregulated. But the practice shouldn't be uncontroversial. When incumbents can know with substantial granularity which voters are likely to support them and which are not, it may skew their incentives to perform constituent services or take account of citizen preferences.

Moreover, segregating people cements existing inequality by homogenizing social networks, which in turn results in unequal access to information about job and life opportunities.[19] It may also inhibit self-discovery, as Julie Cohen has argued,[20] and distort people's political views, as Cass Sunstein has posited.[21] One of the invigorating things about lingering in public spaces in urban areas, or being called for jury duty is the chance it gives you to interact with a broad and fairly representative cross-section of the population. It's that serendipity of essentially random connections with other human beings that make urban life interesting, but also potentially threatening.

A world in which the costs of sorting people approaches zero isn't a world without serendipitous interactions. Chat Roulette was a big fad for a while, after all. But given existing preferences, such a world is likely one in which the haves spend more of their time in the luxury boxes and the have-nots spend more of their time in the cheap seats, or outside the stadium altogether. And the less time is devoted to those serendipitous meetings the harder it becomes for everyone to understand their fellow citizens' motivations, empathize with their problems, and celebrate their achievements.

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19. WILLIAM JULIUS WILSON, WHEN WORK DISAPPEARS: THE WORK OF THE NEW URBAN POOR (1996); Robert L. Wagmiller Jr., *Race and the Spatial Segregation of Jobless Men in Urban America*, 44 DEMOGRAPHY 539 (2007).

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

21. *See* CASS SUNSTEIN, REPUBLIC.COM (2001).