

1 *Basic Services and Trust in Government*

The Glorious, Tragic Legacy of America's Water Systems

Political power is that power . . . given up into the hands of the society, and therein to the governors, whom the society hath set over itself, with this express or tacit trust, that it shall be employed for their good.

John Locke,¹ *Second Treatise of Government*

The use of drinking water is the only interaction that every American is guaranteed to have with their government every day.

Seth M. Siegel,² *Troubled Water*

This book is about basic services and trust in American government. Basic services – the services that are required to maintain a safe, healthy, and productive life – are the bedrock of government legitimacy. The core of liberal political theory is the idea that the authority of any government rests on its ability to provide for its people's basic needs. How do people respond when government fails to provide for those needs? What choices do people make about the basic services they receive, and what are the cumulative consequences of those decisions?

In democracies with market economies such as the United States, people may choose to receive basic services collectively through government or from private commercial firms. A government's people – its citizens – are also consumers; in the United States, most consumers are also citizens. When experiencing problems with basic services, these "citizen-consumers" may demand improvements from government and continue to rely on collectively provided basic service, or they may abandon public services in favor of private, commercial alternatives. In the pages that follow, we argue that individuals' decisions as citizens are bound up in their decisions as consumers. Consumers' spending choices reflect, in part, their identities as citizens, and citizens'

¹ Locke ([1690] 1980, chapter XV, section 171). ² Siegel (2019, 255).

political decisions reflect their assessments of value as consumers. When government produces and/or regulates a basic service, the citizen-consumer's choice between the public provider and a private, commercial firm reflects, in part, her trust in the institutions of government. This book explores the ways that basic service quality relates to trust in government, the ways that commercial firms exploit basic distrust, the ways that citizen-consumers react to basic service failures, and how government responds (or does not respond) to citizen demands for improvements.

Building on insights from political science, economics, and psychology, we advance a theory of the citizen-consumer that connects the quality of basic services to trust in government, trust in government to consumer behavior, consumer behavior to citizen political participation, and citizen political participation back to the quality of basic services. Distilled to its essence, our argument is that when basic services are sound, citizens trust the institutions of government; when basic services fail, citizens distrust those same institutions. Trust in government then manifests itself in consumer behavior: People who trust government rely on public services, whereas those who distrust government opt instead for (usually more expensive) commercial alternatives. Consumers who use public services have a strong interest in safeguarding quality, so they are politically active as citizens. On the other hand, consumers who abandon public services in favor of commercial providers have less incentive to engage with government, so they tend to withdraw from political life. These patterns of political participation feed back into the quality of services. More trusting, active citizen-consumers demand high-quality public services and support investments in those services; their governments respond with strong service quality. Distrustful, disengaged citizen-consumers demand little from government and oppose public investments as wasteful; starved of both resources and attention, governments' service quality will decline. The relationship between government and citizen-consumer is thus reciprocal.

In this opening chapter, we argue that the choices Americans make about the most basic of basic services they receive – the water they drink – reveal deeper lessons about civic life. Our subject is drinking water in the United States, but the ideas that we develop in this book could easily apply to health care, law enforcement, firefighting, housing, postal service, food, transportation, or any other basic

service. The chapters that follow trace the cyclical logic that connects basic service quality, trust in government, consumer choices, and political participation. Although the picture that emerges is often dismal, it also shows that basic services can (re)build trust in the institutions of government in a skeptical and politically polarized age.

Water and Trust

Water is literally essential to human life. All polities, from the smallest, most primitive societies to the most advanced industrial state, must secure and maintain water supplies. Unlike much of what government does, providing drinking water is universally important and immediately relevant every day: In virtually every corner of the country, people brush their teeth with, flush their toilets with, bathe with, cook with, clean with, and drink water every day.

Drinking water is at once a political phenomenon and a consumer product. In the United States, federal and state governments are jointly responsible for regulating drinking water health for all drinking water systems in the country. American local governments are the main owners and operators of community drinking water systems. Even where community water systems are owned and operated by investor-owned firms, state agencies regulate their quality and pricing. As such, government is responsible for the *provision* of tap water, even when tap water service is *produced* by privately owned utilities. With water systems so heavily regulated and largely owned by local governments, water policy and management are intensely and inherently political in ways that most other goods and services are not. If basic services are the bedrock of government legitimacy, then water is the foundation of the edifice of the state.

The rise of the bottled water industry in the United States is an alarming indication of cracks in that foundation. An increasing share of Americans report that they do not drink the water that flows from their taps. Consumption of bottled and other commercial drinking water in the United States has skyrocketed over the past two decades, as the dashed line in Figure 1.1 shows. According to the International Bottled Water Association (IBWA), Americans purchased 5.1 billion gallons of unflavored, noncarbonated bottled drinking water in 2001, generating \$6.9 billion in wholesale revenue. Over the next twenty years, the bottled water industry in the United States nearly tripled to

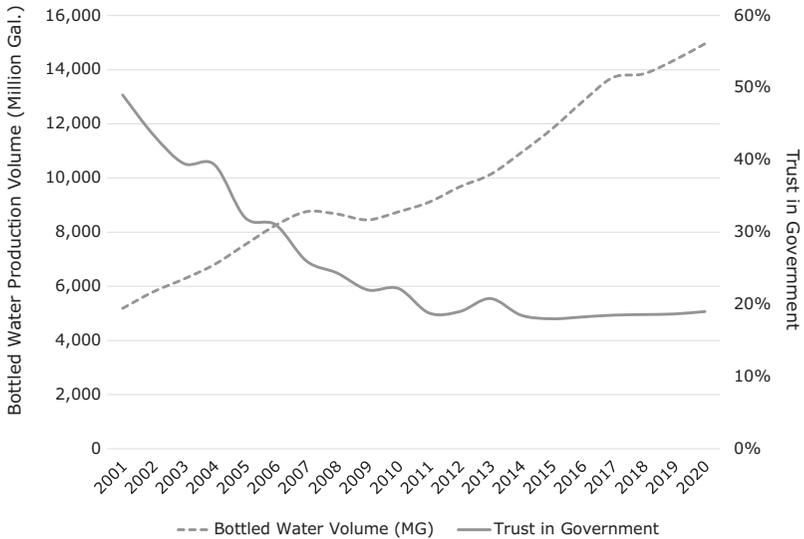


Figure 1.1 US bottled water sales volume and trust in government, 2001–2020.

Sources: International Bottled Water Association; Pew Research Center. Trust in Government is percentage of survey respondents who trust the government in Washington to do what is right always or most of the time.

15.0 billion gallons of annual volume and \$20.1 billion in wholesale revenue (Rodwan 2020). In 2016, the bottled water industry passed a major milestone when bottled water surpassed carbonated soft drinks as America’s most popular bottled beverage, accounting for nearly a quarter of all bottles sold. In 2020, Americans spent more than \$36.2 billion retail on bottled water. The robust and rapidly expanding commercial water industry in the United States presents a puzzle: *Why do Americans opt for more expensive commercial drinking water when high-quality tap water is widely available?*

The commercial water industry’s remarkable rise has come at a time of declining trust in American institutions generally, and declining trust in government specifically (Gramlich 2019). According to the Pew Research Center, the share of Americans who “trust the government in Washington to do what is right always or most of the time” fell from 49 percent in 2001 to 17 percent in 2019 – an astonishing 32-point drop over eighteen years. The solid line in Figure 1.1 shows the concomitant fall of trust in government from 2001 to 2020. The two lines – the rise of bottled water sales and the decline of trust in

government – run in opposite directions, with eerily similar, though divergent, long-term trends: Over the period shown in Figure 1.1, bottled water volume grew by an average of 5.9 percent annually and trust in government fell by 4.6 percent annually.

This book aims to demonstrate that the two trends in Figure 1.1 are neither coincidental nor inevitable. The steady, alarming decline in Americans' trust of government has emerged as a major focus of political anxiety and social research in recent years. The chapters that follow articulate the logic that connects basic service quality (in our case, tap water) to trust in government, trust in government to consumer behavior, consumer behavior to citizen political behavior, and citizen political behavior back to government performance. This opening chapter examines the significance of water systems in American political development, the rise of commercial water, and the role of local, state, and federal governments in drinking water provision. As we will see, the evolution of drinking water in America raises fundamental questions about the reciprocal relationship between citizens and the state.

A Legacy of Infrastructure

Government legitimacy and drinking water provision are intimately tied. American political development is in many ways a story of water infrastructure development. In the late nineteenth century and for much of the twentieth century, water utilities in the United States earned well-deserved reputations for delivering reliable, high-quality, potable drinking water. The rise of drinking water systems and sanitary sewers in the United States eliminated waterborne diseases such as cholera and typhoid that had ravaged cities for centuries. With improved water systems came improved public health and economic performance. Along with urban sewer and sanitation systems, America's drinking water utilities were a collective triumph in urban infrastructure.

That triumph is a mark of government success. Historian Jon Teaford (1984) observed that, in late nineteenth-century America,

Municipal officials were employing the latest engineering technology to create systems of water supply and drainage of unrivaled size. American municipalities administered a larger network of mains than any other governing body in the world; they provided a greater supply of water than any other city worldwide; and they sponsored unmatched schemes of

engineering. *The waterworks and sewer systems of America were objects worthy of pride.* (225, italics added)

For example, in 1908, Jersey City, New Jersey, became the first city in the United States to disinfect its water through continuous chlorination – a move that dramatically reduced typhoid fever and several other waterborne diseases (McGuire 2013). Within a decade, half of the nation’s water utilities had followed suit. By the 1930s, American governments’ water supply systems were almost entirely chlorinated, and the nation had largely conquered “the waterborne diseases which ravaged America during the late nineteenth and early twentieth century” (Douglas 1976, 502). These miracles of urban infrastructure were credit-claiming opportunities for public officials, as American cities leapt ahead of their European counterparts in the scope and quality of their water infrastructure. With iron and concrete, water and sewer systems helped transform American cities from squalor to prosperity.

Politicians built the modern American party system as they built these water systems, with the credibility of the former resting in part on the integrity of the latter (Teaford 1984). Far more than utilitarian, water supply facilities were testaments to civic achievement and the burgeoning nation’s political leadership. When the City of Saginaw, Michigan, completed its water treatment plant in 1929, top-hatted politicians made speeches and held citywide celebrations (Reinsch 2016). A parade through Saginaw ended at the city’s new treatment plant and featured the ceremonial burial of a hand pump to symbolize the dawn of modern in-home water service. Beautifully designed, the plant featured state-of-the-art treatment technology and the works of local artists. Over the front door of the new Saginaw plant, a sign declared, “The World’s Best Water.” This scene repeated itself across the country as new plants opened in the late nineteenth-century and early twentieth-century heyday of American drinking water system construction. From New York to Cincinnati to Seattle to Miami, reservoirs, water towers, and treatment plants were both functional and beautiful. The monumental architecture that accompanied these facilities stood as testimonies to their social and political value. Drinking water and sewer systems improved life in American communities, immediately and tangibly, inspiring confidence in the governments that created them. Just as in the ancient Roman Empire,

aqueducts and sewers brought health and prosperity to flourishing American cities, simultaneously serving as powerful reminders of the state's political genius and might.

New contaminants began to threaten drinking water supplies in the mid-twentieth century as American industry grew and matured, and federal regulatory reforms in the 1970s made important strides in controlling water pollution and bolstering drinking water quality in the United States. Congress passed the 1972 Clean Water Act and 1974 Safe Drinking Water Act (SDWA), along with other landmark federal environmental laws. These laws sparked important advancements in water treatment technology and produced a generation of environmental and water quality engineers through investments in research and education. In 1996, major amendments expanded the SDWA to enhance risk assessment and, especially, to increase transparency and public confidence in water supplies.

This legacy of government water provision and regulation means that Americans' relationships with their water shape and reflect their relationships with the institutions of American government at every level: local, state, and federal. In the United States, electricity, gas, and telecommunications utilities are overwhelmingly owned and operated by private, investor-owned firms. But about 85 percent of Americans receive their drinking water from a water utility operated by a local government. Where local governments provide water service, citizens own the infrastructure that serves them. Most of these systems are parts of municipalities, counties, special districts, tribal agencies, or other authorities managed by elected officials and public administrators. Where investor-owned utilities operate drinking water and sewer service, these water systems are heavily regulated and governed by state agencies under a host of environmental, health, safety, and financial laws. Overseeing these hundreds of state agencies and thousands of water utilities are federal regulatory agencies. Put simply, American government is responsible for the provision of drinking water, and the legitimacy of American governance institutions was built in no small part on public confidence in public water systems.

The Rise of Commercial Drinking Water

Despite America's legacy of inexpensive, widely available, highly reliable, high-quality tap water, the commercial drinking water industry –

that is, bottled and kiosk water – in the United States has exploded over the past two decades, as Figure 1.1 indicates. Once rare, bottled water is now commonplace. Luxury brands such as VOSS and FIJI Water sell for up to \$15 per bottle, with a handful of elite brands absurdly selling for thousands of dollars. But far more prevalent are half-liter plastic bottles sold in ubiquitous cases at grocery and discount stores under brands such as Aquafina, Arrowhead, Ozarka, and Crystal Geyser. Wheeled out of big-box stores and into catered lunches and home refrigerators, these bottles have become part of everyday American life. Such growth would be remarkable for any industry, but the rise of bottled water in the United States is particularly striking because most Americans have easy access to a more carefully regulated, often qualitatively superior, and always far less expensive alternative: tap water.

State and federal agencies regulate tap water quality in the United States under the SDWA, which requires regular testing, imposes specific limits on contaminants known to endanger human health, and obliges water utilities to report drinking water quality and other issues to the public.³ Unlike tap water, bottled water quality is largely unregulated at the state level. With bottled water classified as “packaged food,” production facilities are subject to inspection by the US Food and Drug Administration (FDA) at the federal level, and formally bottled water is supposed to meet the same contaminant limits that the SDWA requires for tap water. However, bottled water often fails to meet SDWA-level quality standards when subject to rigorous testing (Ikem et al. 2002; Pip 2000; Sharp & Walker 2002), and it can expose consumers to leachate from plastic containers (Mason, Welch, & Neratko 2018; Wagner & Oehlmann 2009; Westerhoff et al. 2008). Moreover, bottled water manufacturers are not subject to the SDWA’s public reporting requirements.

Beyond water quality concerns, bottled water carries significant environmental impacts. The production of plastic water bottles requires energy and petrochemicals. Gleick and Cooley (2009) estimated that in 2007 the production and distribution of bottled water required between 32 and 54 billion barrels of oil. Water is also quite heavy, so distributing bottled water from factory to consumer requires

³ One American tribal government, the Navajo Nation, also regulates drinking water quality within its jurisdiction.

significant surface transportation costs, sometimes across great distances. Perhaps the most famous – or notorious – example is FIJI Water. Extracted from an artesian aquifer on the remote South Pacific island, FIJI Water is transported more than 10,000 kilometers to consumers in the United States. Bottled water also generates significant waste, as less than a quarter of bottles are recycled (Gitlitz & Franklin 2007). Instead, used bottles become litter or are diverted to landfills, where they degrade very slowly (Gironi & Piemonte 2011). Jungbluth (2005) estimates that the environmental impact of one liter of bottled water is more than 100 times the impact of a liter of tap water. Taken together, these externalities take a heavy toll on the environment. Despite these concerns, a growing number of Americans apparently are willing to *pay far more for a more lightly regulated* product that harms the environment.

Urban Water Kiosks in the United States

Similarly puzzling is the recent proliferation of commercial drinking water kiosks in American cities. Water kiosks are privately owned, automated vending machines that dispense drinking water in exchange for payment. Journalists and academic researchers have spilled plenty of ink on the growth and pathologies of bottled water, but relatively little is known about water kiosks in the United States.⁴ Kiosks can be located within businesses or freestanding. These automated vending machines are frequently located in parking lots in front of dollar stores and provide “purified” drinking water to customers. Individuals travel to kiosks, bring their own containers, insert cash or pay with a credit card, fill their containers with the purchased water, and then leave. Typically priced at 25–35 cents per gallon, kiosk water is cheaper than bottled water, but still far more expensive than tap water on a volumetric basis. For instance, basic residential water and sewer prices in Houston averaged 1.5 cents per gallon in 2019. In Cleveland it was 1.9 cents per gallon; in Boston and Detroit it was 1.3 cents; in Memphis, Phoenix, Pasadena, and Salt Lake City, a gallon of residential water service cost less than a penny.

⁴ The few studies that exist focus on the relationship between water quality, demographics, and kiosk location in rural, southern Texas *colonias* (Jepson 2012; Jepson & Brown 2014; Jepson & Vandewalle 2016).

Kiosks draw their water supply from the municipal drinking water utilities where they are located, and their operators claim to apply additional filtration within the kiosk prior to dispensing. But in the United States, water kiosks operate mostly in a regulatory lacuna. Kiosks are not subject to state or federal SDWA rules (except insofar as their tap water sources must comply with the SDWA). Some jurisdictions regulate kiosks under local building codes for also structural safety or as vending machines for fraud prevention. But extensive review found no state or federal guidelines that regulate the quality of water from kiosks, the maintenance of kiosks, or public reporting about kiosks. A 2002 Environmental Law Foundation study tested water quality samples from California water kiosks, finding that more than a third dispensed water that violated state water quality standards and roughly two-thirds of the tested units failed to attain their claimed water purity (Sharp & Walker 2002). Furthermore, the reverse osmosis treatment processes that kiosk companies claim to apply generate by-products that flush into urban sewer systems without measurement or monitoring. Water kiosks are effectively unregulated in the United States, and their claim of dispensing water superior to what flows from the tap is almost entirely untested.

Drinking water kiosks are common in the developing world, where access to potable water is scarce, public water is unreliable, and commercial water is often clearly preferable despite its high price. And predictably, water kiosks established some of their first footholds in the United States in regions with very poor tap water quality, with unreliable potable water utility service, or where tap water is entirely unavailable, such as the Rio Grande Valley of South Texas (Garcia & Hernandez 2011; Jepson 2012) and parts of rural Appalachia (Appalachian Regional Commission 2015; Arcipowski et al. 2017). But commercial water flourishes not only in poor, isolated communities with histories of water quality problems. Kiosks are also common in communities that boast strong tap water utilities – they abound in Houston, Phoenix, and other major cities with professionally managed utilities and excellent SDWA compliance records, as Figure 1.2 shows.

To summarize, drinking water utilities provide water at a much lower unit cost than bottled water and water kiosks, are far less environmentally destructive, and are subject to quality and public reporting requirements that commercial drinking water sellers are not. Millions of Americans are nonetheless willing to buy loosely

regulated commercial drinking water at vastly more expensive prices than the highly regulated water that flows from their taps. Although water utility rates have risen sharply in recent years and affordability has emerged as an urgent political issue in the United States (Bartlett et al. 2017; Kane 2018; Teodoro 2018, 2019; Teodoro & Saywitz 2020), tap water prices remain very low compared with most other essential household expenses (e.g., housing, health care, food, taxes, or home energy). More importantly for present purposes, tap water is *far* less expensive than its commercial alternatives, with prices much cheaper than bottled or kiosk water on a volumetric basis (Hu, Morton, & Mahler 2011).

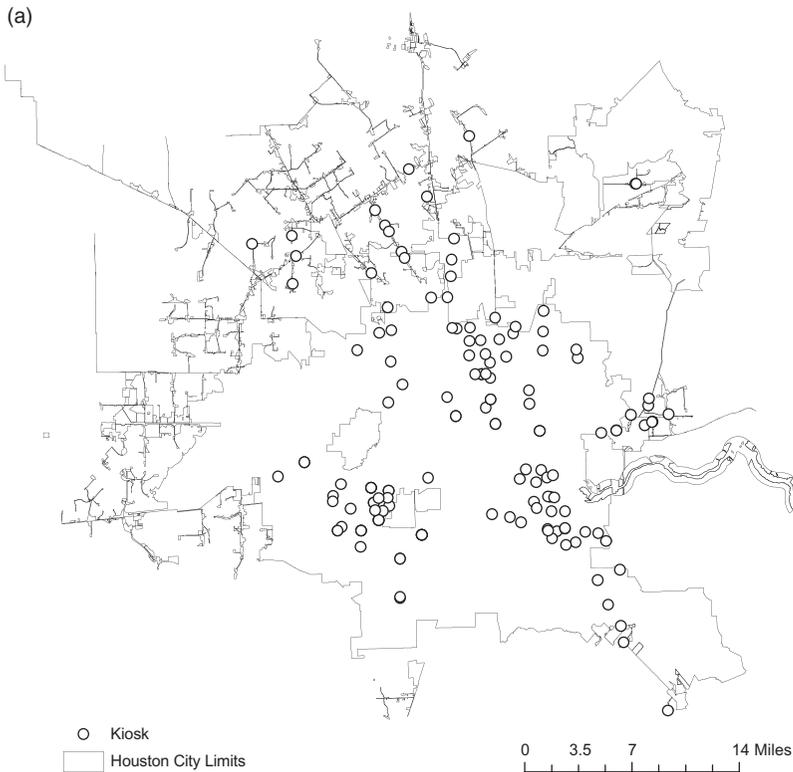


Figure 1.2 Water kiosks in Houston and Phoenix, 2017.

(a) Watermill Express and Ice House America Kiosks in Houston, TX | *Source:* Original data.

(b)

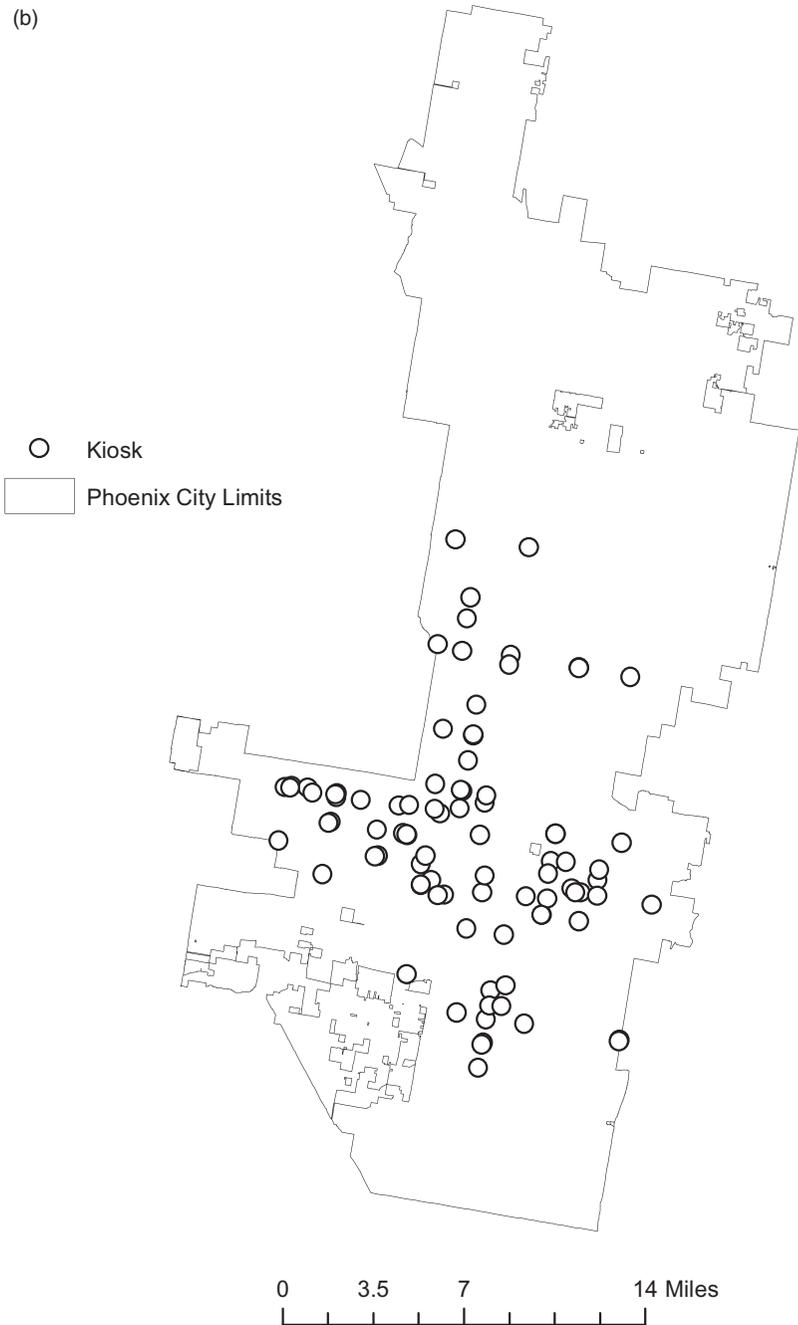


Figure 1.2 (cont.) (b) Watermill Express and Ice House America Kiosks in Phoenix, AZ | Source: Original data.

Puzzling Perceptions

The burgeoning bottled water business and the emergence of water kiosks in major US cities thus present a paradox. What causes consumers to opt for far more expensive and environmentally destructive commercial water of dubious quality, rather than cheaper, environmentally sustainable, and more rigorously regulated tap water? *What explains the decline in tap water consumption and the concomitant growth of bottled water and drinking water kiosks in America?*

If consumers are rational, then people who choose to drink commercial water must *believe* that its quality is different from and superior to tap water quality in some important way. Empirical investigation affirms this expectation: Several recent studies link bottled water consumption to a perception that bottled water is safer than tap water (Doria, Pidgeon, & Hunter 2009; Levêque & Burns 2017, 2018). Of course, in some situations tap water quality really *is* questionable or outright dangerous (Siegel 2019). American tap water is safe, by and large; however, some utilities are poorly managed, and regulatory regimes are often slow to address new contaminants. Drinking water contamination events sometimes occur, and natural or manmade disasters can objectively harm public drinking water supplies. As we will see in the chapters ahead, such disasters can shake confidence in tap water long after and far away from any actual danger.

Beyond safety, drinking water appearance, taste, and odor might cause consumers to buy more expensive bottled or kiosk water instead of tap water; such aesthetic considerations certainly drive consumer behavior in other retail markets. Recent studies affirm that perceptions of aesthetics are associated with bottled water consumption (Graydon et al. 2019). But blind taste testing yields no consistent evidence of differences in taste between bottled and tap water (Debbler et al. 2018), which suggests that perceptions that commercial water tastes better than tap water are mostly illusory.

It might be tempting to dismiss this curious and growing perception of commercial water's superior quality as an economic oddity. Consumers buy many luxury goods that confer social status or other psychological benefits that justify their higher prices relative to qualitatively similar substitutes. In the case of drinking water, consumer preference for expensive commercial water from supermarket shelves or drive-up kiosks is not necessarily a public policy problem. If bottled

water carries negative environmental externalities, then the appropriate policy response is to manage or reduce those externalities through taxation or regulation (Switzer 2019b). Costly alternatives to tap water do not in themselves threaten public welfare, much less the legitimacy of democratic institutions.

But a peculiar pattern in this consumer behavior indicates that purchasing bottled or kiosk water is not a simple story of a self-indulgent luxury good. Something more than affluence and evolving tastes is driving the spectacular rise of commercial water in the United States.

The Curious Demographics of Commercial Drinking Water

Commercial drinking water consumption in the United States is neither random nor even across the country. Plotted geographically, the distribution of 2017 average per household bottled water sales in Figure 1.3 hints at how drinking water purchasing varies across US counties. Kiosks also hint at visual patterns when mapped across the United

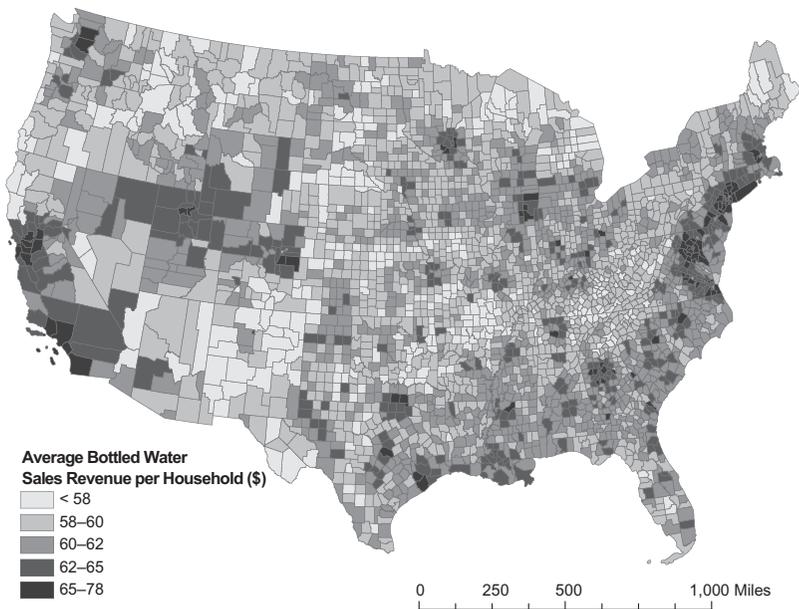


Figure 1.3 Average bottled water sales per household by county, 2017.

Source: Household average bottled water sales (2017) from SimmonsLocal.

States. Unlike bottled water, water kiosks are fixed in geographic space, so they provide an extraordinary opportunity to analyze the spatial distribution of commercial water consumption. Figure 1.2 showed the distribution of kiosks operated by Watermill Express and Ice House America in Houston and Phoenix; Figure 1.4 shows 2017 kiosk locations across the United States.

A cursory look at these maps suggests nonrandom spatial patterns in commercial water consumption. If consumer preference for commercial water is driven mainly by aesthetics, then perhaps differences in source water quality across the country lead to more or less commercial water demand in different regions. It is harder to explain why people prefer commercial water to tap water in different neighborhoods within a single city (as the maps of Houston and Phoenix in Figure 1.2 suggest) when a single utility provides tap water to all.

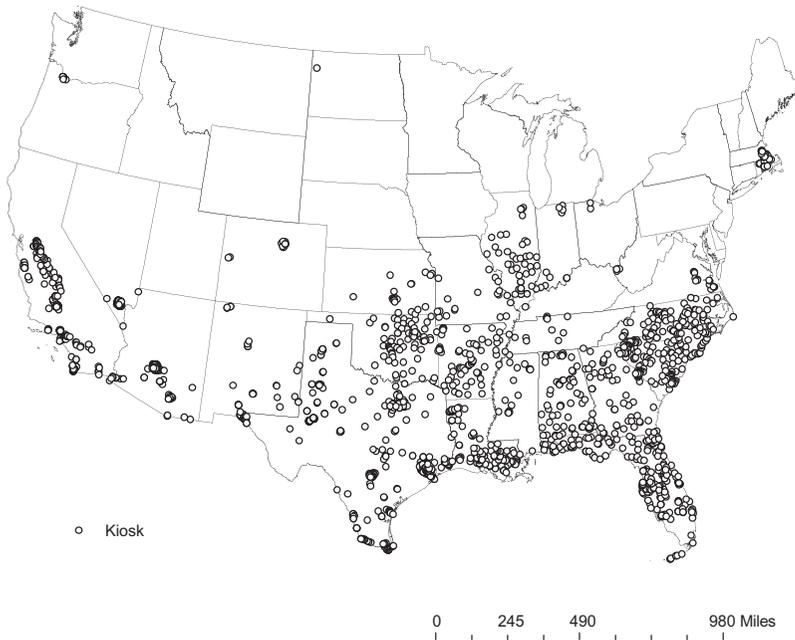


Figure 1.4 Watermill Express and Ice House America kiosk locations, 2017. *Source:* Original data set; see Appendix B for information on data collection.

Bottles and Jugs for the Poor

In spite of its reputation and pricing as a luxury product, commercial drinking water spending in the United States is inversely related to income. A raft of research over the past decade has found that bottled water is most popular among low-income households in the United States and that more affluent American households are likely to drink tap water. In separate studies of National Health and Nutrition Examination Survey data, teams led by researchers at the University of Washington (Drewnowski, Rehm, & Constant 2013) and Penn State University (Rosinger et al. 2018) found that bottled water consumption was greatest among lower-income respondents, whereas higher-income individuals were much more likely to opt for tap water. College-educated people were more than twice as likely to drink tap water and significantly less likely to drink bottled water, compared to individuals without a college education. A 2019 survey of roughly 1,200 Los Angeles County residents found the same pattern, with well-educated and higher-income households more likely to drink tap water and less-educated, lower-income households more likely to drink bottled water (Family et al. 2019). A survey of Phoenix residents led by an Arizona State University team found that bottled water consumption was inversely related to income: As household incomes increased, tap water consumption increased and bottled water consumption decreased (York et al. 2011). The findings in Phoenix are especially notable because a single water system serves the desert city's entire population of 1.7 million.

Kiosk locations within cities also fit awkwardly with a depiction of commercial water as a luxury good. Although their product is cheaper than most bottled water, kiosk water is still far more expensive than tap water. Even so, Figure 1.5 shows that kiosks seem to be located in lower-income areas within American cities (i.e., kiosks locate in lighter-shaded areas). We examine kiosk locations in detail in Chapters 3, 4, and 6, but even an initial look at Figure 1.5 casts doubt on any depiction of water kiosks as luxury retailers. The upper- and middle-class preference for tap water and popularity of commercial drinking water among the poor suggest that the perception of commercial water as a luxury good is an illusion. The negative correlation of income and commercial water consumption is also difficult to square with the argument that taste preference drives the growth in bottled and kiosk water. Why would lower-income people prefer the taste of bottled water and middle- or upper-income people prefer the taste of tap water?

Race, Ethnicity, and Drinking Water

Equally striking are the ethnic and racial patterns of commercial water consumption in the United States. The line of research that revealed the surprising socioeconomics of bottled water demand found similarly stark racial and ethnic patterns in drinking water behavior. Perhaps most notable is the difference in drinking water behavior among Hispanic consumers in the United States. Bottled water consumption is markedly higher among Hispanics in recent National Health and Nutrition Examination Survey

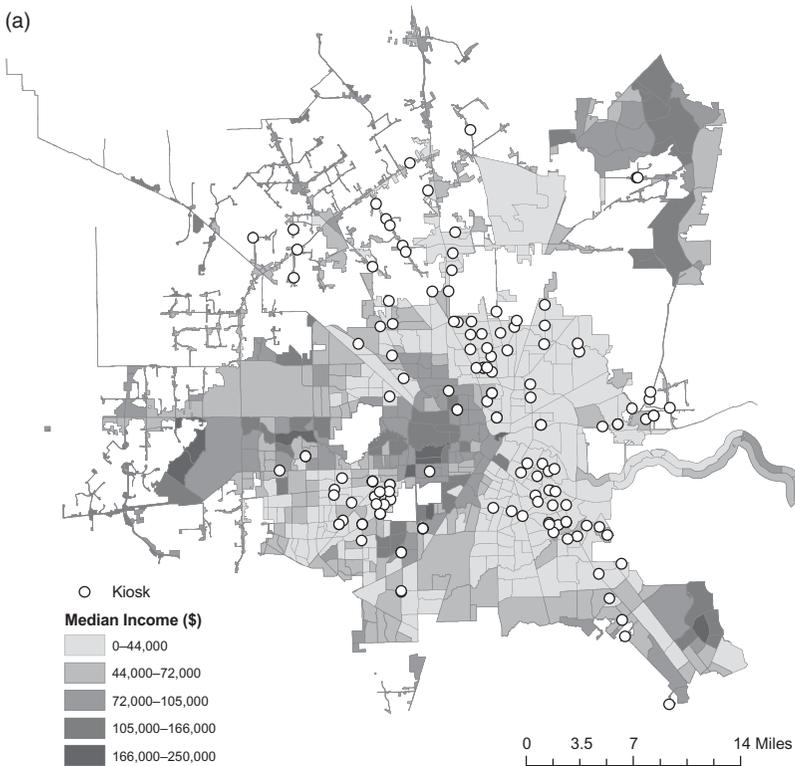


Figure 1.5 Kiosk locations and median household income by census tract, 2017.

(a) Kiosk location by 2016 census tract median income in Houston, TX. Labels rounded to the nearest \$1,000. Categories set with Jenk’s Natural Breaks. | *Source:* Kiosk data original, 2016 Median Income from U.S. Census Bureau.

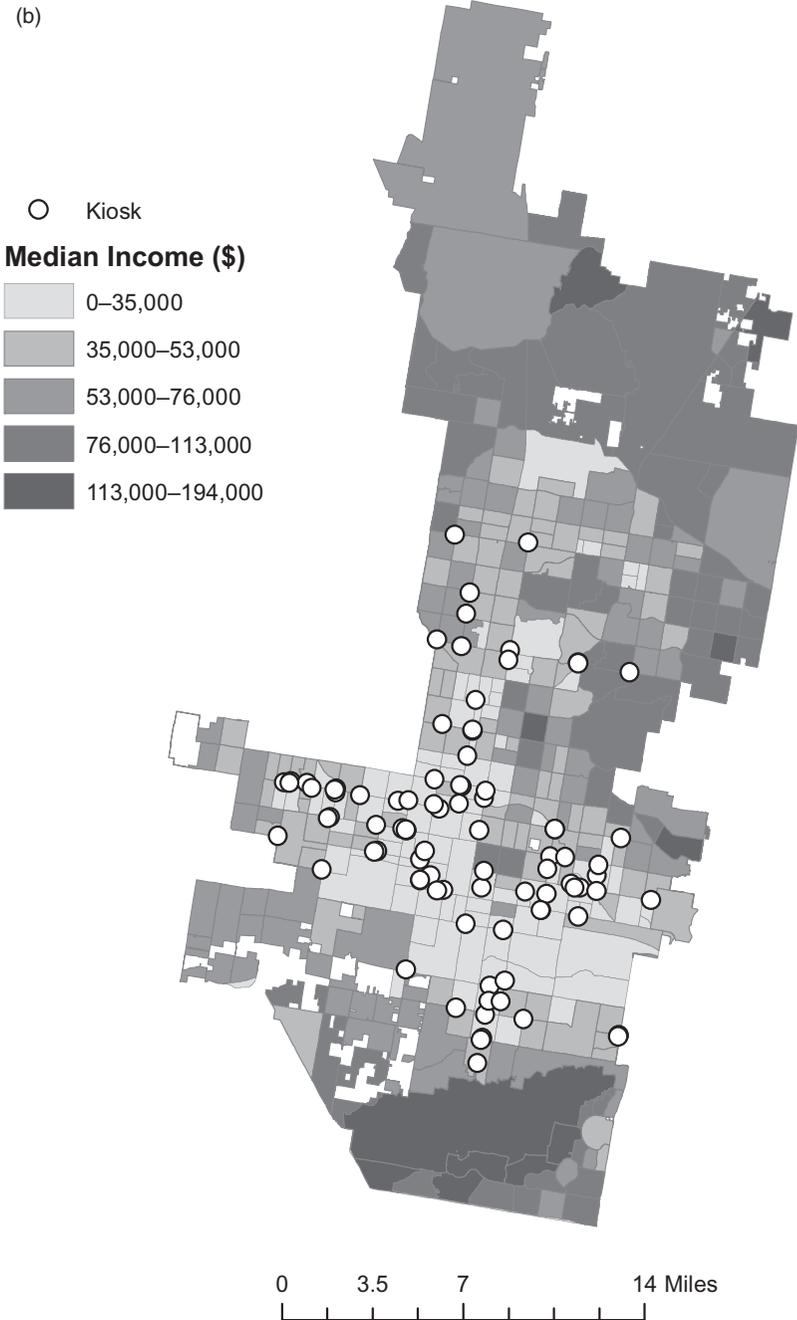


Figure 1.5 (cont.) (b) Kiosk location by 2016 census tract median income in Phoenix, AZ. Labels rounded to the nearest \$1,000. Categories set with Jenk's Natural Breaks. | *Source:* Kiosk data original, 2016 Median Income from U.S. Census Bureau.

analyses (Drewnowski et al. 2013; Rosinger et al. 2018). After adjusting for age, education, and income, Rosinger et al. (2018) find that, compared with non-Hispanic whites, Hispanics were half as likely to drink tap water and more than twice as likely to drink bottled water. The geographic distribution of 2017 kiosk locations in Figure 1.6 is consistent with those studies (i.e., kiosks are located in areas shaded darker).

The prevalence of bottled water consumption among Hispanic Americans is sometimes attributed to “culture” or water habits that recent immigrants developed in home countries before arriving in the United States (Scherzer et al. 2010). However, the disparity in bottled

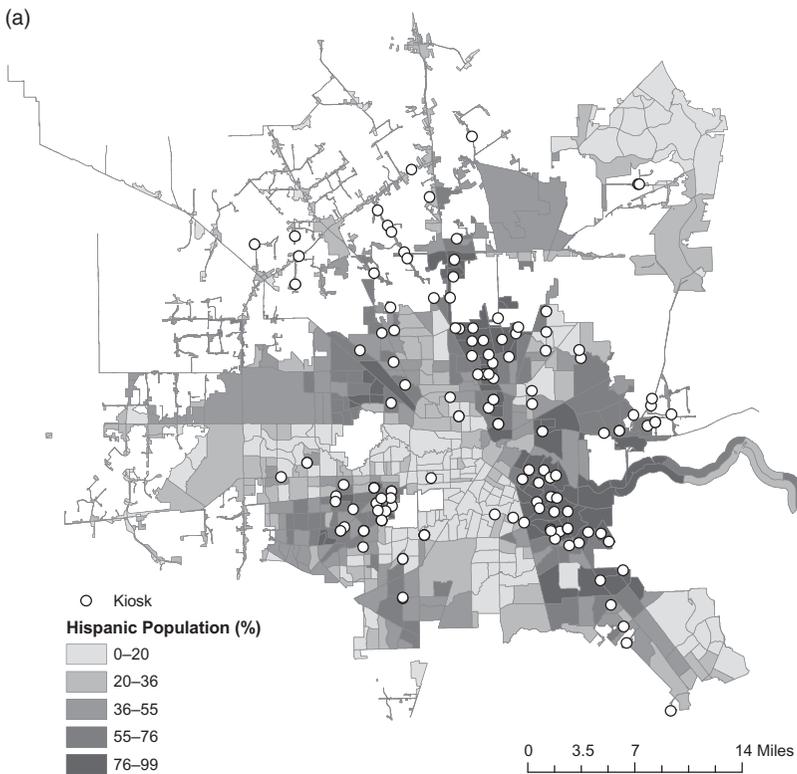


Figure 1.6 Kiosk locations and percent Hispanic population by census tract, 2017.

(a) Kiosk location by percent Hispanic population (2016) in Houston, TX. Categories set with Jenk’s Natural Breaks. | *Source:* Kiosk data original, 2016 Hispanic population from U.S. Census Bureau.

(b)

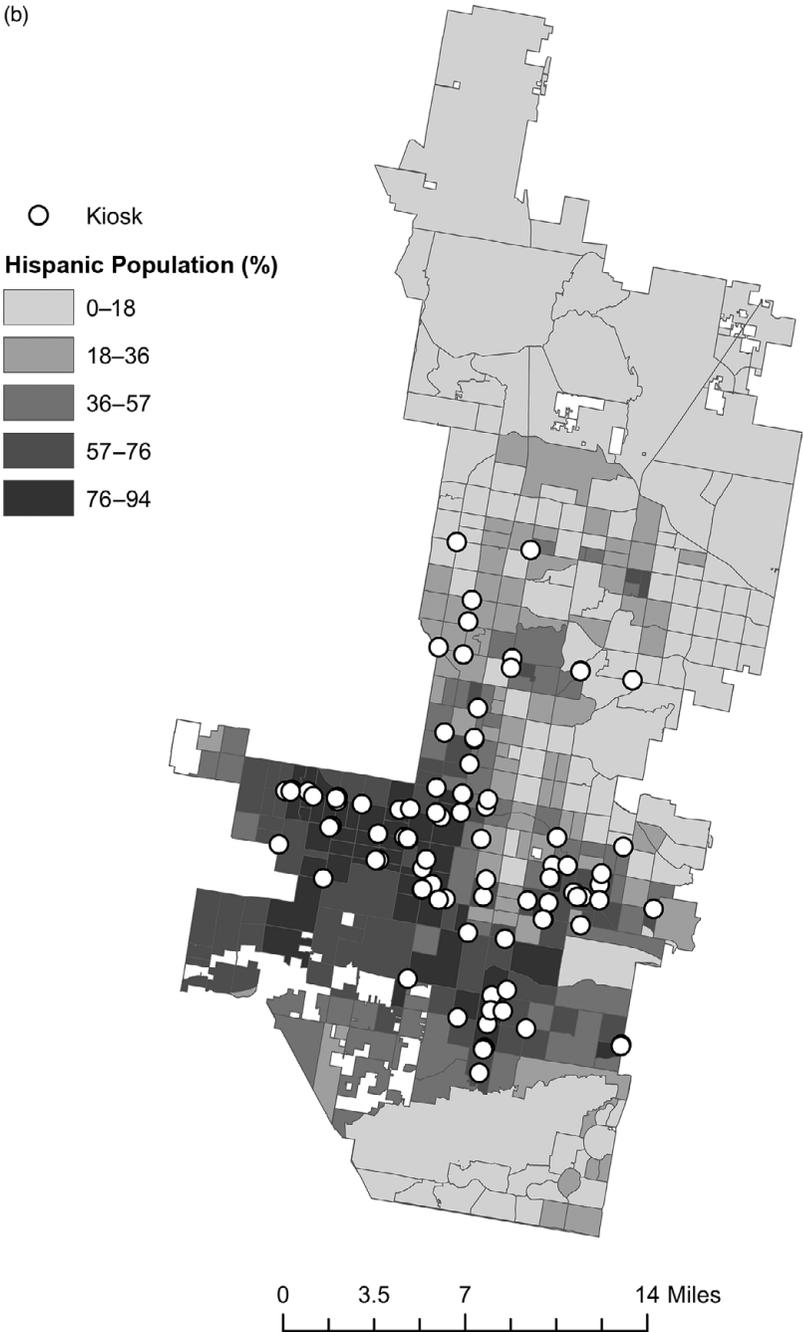


Figure 1.6 (cont.) (b) Kiosk location by percent Hispanic population (2016) in Phoenix, AZ. Categories set with Jenk’s Natural Breaks. | *Source:* Kiosk data original, 2016 Hispanic population from U.S. Census Bureau.

water consumption between Hispanic and non-Hispanic whites remains large, even after accounting for immigration status or time since immigrating (Hobson et al. 2007; Rosinger et al. 2018). Also countering the idea that Hispanic bottled water consumption is an imported cultural behavior is the similar prevalence of bottled water consumption among Black people who were born and raised in the United States. National Health and Nutrition Examination Survey data show that overall bottled and tap water consumption among Blacks and Hispanics are similar (Drewnowski et al. 2013; Rosinger et al. 2018). Figure 1.7 hints that kiosk locations in Houston and Phoenix might correlate with neighborhoods' racial composition.

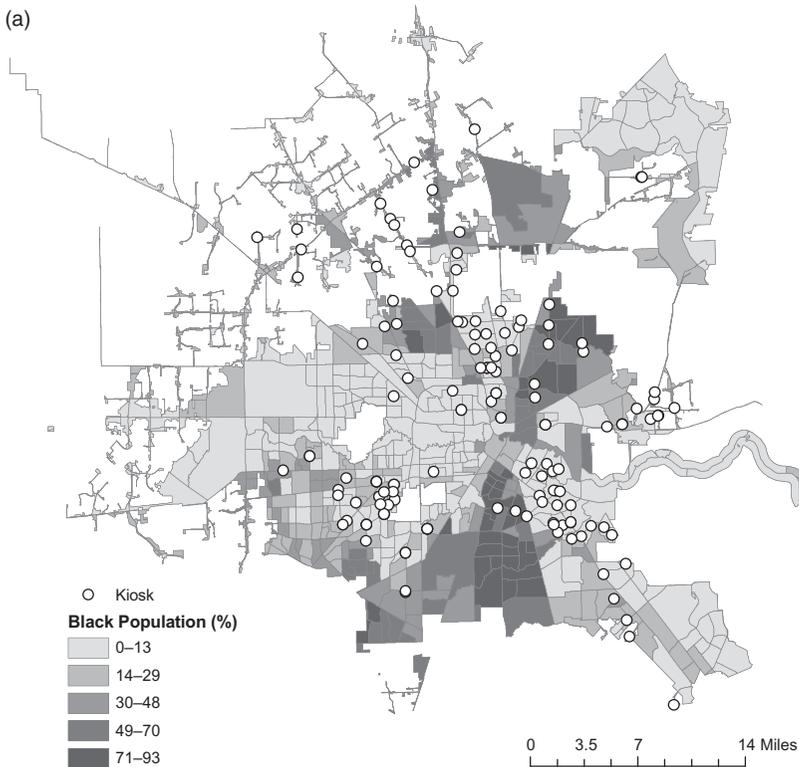


Figure 1.7 Kiosk locations by census tract percent Black population, 2017.

(a) Kiosk location by percent Black population (2016) in Houston, TX. Categories set with Jenk’s Natural Breaks. | *Source:* Kiosk data original, 2016 Black Population from U.S. Census Bureau.

(b)

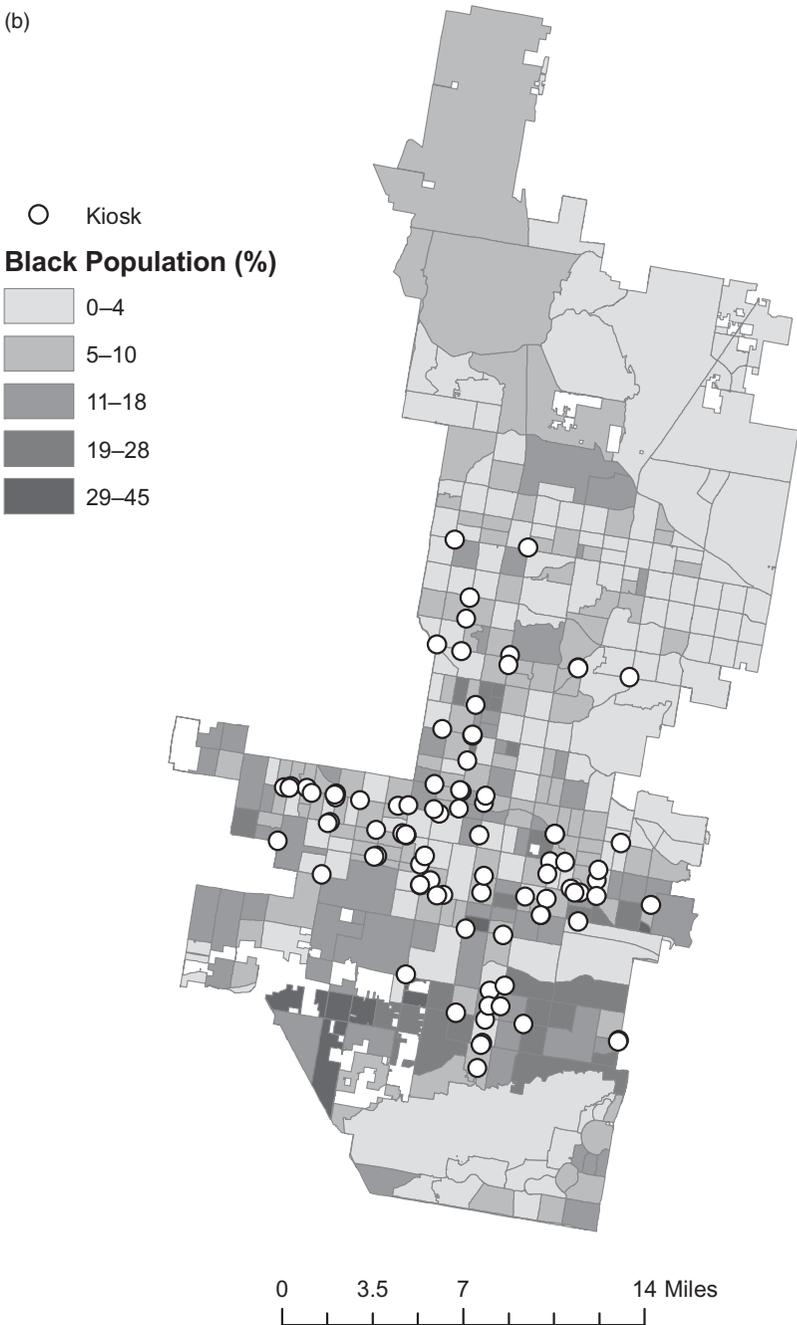


Figure 1.7 (cont.) (b) Kiosk location by percent Black population (2016) in Phoenix, AZ. Categories set with Jenk's Natural Breaks. | Source: Kiosk data original, 2016 Black Population from U.S. Census Bureau.

Patterns of Perception

The large and rapidly growing commercial water industry implies that a significant share of consumers believes that water from bottles and/or kiosks is qualitatively superior to tap water. A 2011 survey of more than 3,200 Americans by researchers at Iowa State University and the University of Idaho found that perceived tap water quality was the single strongest predictor of bottled water consumption: Compared with people who trust their home tap water, respondents who did not believe that their tap water was safe were nearly five times as likely to use bottled water as their primary drinking water source (Hu et al. 2011; see also Abrahams, Hubbell, & Jordan 2000; Saylor, Prokopy, & Amberg 2011).⁵ Growing evidence indicates that perceptions of tap water quality vary markedly by income and across racial and ethnic groups. Analysis of American Housing Survey data by UCLA researchers found a strong, positive correlation between household income and perceived tap water quality (Pierce & Gonzalez 2017). The same studies found lower trust in tap water among Blacks and Hispanics, compared with non-Hispanic whites (see also Javidi & Pierce 2018). Similar racial and ethnic patterns of distrust in tap water emerge in studies of African Americans in urban settings (Huerta-Saenz et al. 2012) and rural Hispanic communities (Scherzer et al. 2010).

These racial and ethnic disparities in tap water versus commercial water perception and consumption defy easy explanation. Is trust or distrust of tap water rooted in fact and reason? Are perceptions of water quality reflexive responses to sensational media? Is widespread distrust of tap water little more than superstition?

Leaving aside whether consumers can really perceive differences in taste between tap water and commercial water, it is difficult to imagine why taste in drinking water would vary systematically across racial or ethnic groups. An argument that Hispanics eschew tap water because they are socialized with cultural norms that value commercial water over tap water effectively begs the question. Simple cultural explanations cannot account for mistrust of tap water among native-born Black Americans or differences in perceptions about tap water quality among rich and poor and among high school educated and college

⁵ Hu et al. (2011) also found that people who relied on private wells – which are effectively unregulated and of uneven quality – were *less* likely to use bottled water than customers of municipal utilities.

educated – especially when people receive tap water from the same system. Immigrants’ experiences with and expectations about tap water from their countries of origin may explain some of the disparity in distrust (Pierce & Gonzalez 2017), but an explanation of distrust in tap water rooted in past ethnic experience is more rational than cultural. That is, if Hispanic mistrust of tap water originates with failing water systems in other countries, then Hispanic immigrants’ preference for commercial water is a rational response to expectations about the institutions that provide drinking water.

Institutional Trust at the Tap

Whether problems with tap water are real or merely perceived, the proliferation of bottled water and kiosks suggests that people choose these more expensive products because they perceive tap water quality as inferior to commercial water quality. Crucially, perceptions of tap water vary in part *because tap water comes from government*. Perceptions of tap water quality, therefore, are a function of people’s trust in government: To trust tap water is to trust the government.

Distrust and Defensive Spending

It could be that Hispanic and Black populations are disproportionately burdened by poor-quality tap water in ways that sow broader distrust of water utilities. The 2015 water crisis in Flint, Michigan, captured national headlines not only for the city’s contaminated water, but also because Flint’s plight framed drinking water in terms of race, socio-economic class, and democracy (Pauli 2019). A majority of Flint’s population is Black, and at the time of the crisis more than 40 percent of its households had incomes below federal poverty levels. Victims of Flint’s drinking water contamination crisis were thus disproportionately poor and Black, whereas the state politicians and regulatory officials whose actions precipitated the crisis were mostly white and middle class. Popular accounts and official investigations of what came to be known as the “Flint water crisis” cast the event as a case of environmental injustice rooted in failures of governance (Davis et al. 2016). More than a public health disaster, the Flint water crisis’s environmental justice frame evoked political identity for Blacks specifically and poor people generally (Čapek 1993). For many, the message of the Flint water crisis to the people of the United States was this: *Your*

tap water may be contaminated because the government does not care about you – especially if you are poor and Black.

Flint is not alone, unfortunately. Analysis of US Environmental Protection Agency (EPA) data on community drinking water systems across the country reveals serious and significant racial, ethnic, and socioeconomic disparities in SDWA compliance. SDWA water quality violations are more common in communities with higher Black and especially Hispanic populations; moreover, these racial and ethnic disparities are greatest in poorer communities (Switzer & Teodoro 2017, 2018). That is, drinking water contamination is most common where people are both poor and nonwhite. Distrust of tap water among low-income and/or racial and ethnic minority populations seems more reasonable in light of these findings: For people who have experienced tap water that endangers human health, a preference for expensive alternatives is entirely rational. However, for people who have not experienced tap water that endangers human health, the preference for expensive alternatives is puzzling. Socioeconomic, racial, and ethnic differences in water consumption persist even within communities served by water utilities with sound records of drinking water quality (Javidi & Pierce 2018; Patel 2019). Distrust of tap water among poor and minority populations seems to grow not only from direct lived experience, but also from a shared identity with those who have experienced drinking water problems.

Black and Hispanic preference for bottled water follows in part from these systematic disparities in SDWA compliance, argue economists Kip Viscusi, Joel Huber, and Jason Bell (2015). High-profile contamination events lead consumers to “defensive spending” on commercial water in response to perceived health risks from far less expensive tap water (Dupont & Jahan 2012). This defensive spending is rooted in a deep distrust of tap water, even where there are no apparent health problems with tap water or health benefits to commercial drinking water.

*Merchants of Thirst*⁶

Commercial water firms’ marketing tactics and growth strategies align eerily with defensive spending as a source of profit. Consider the Primo

⁶ The phrase “merchants of thirst” was the headline of a *New York Times* story about commercial water providers in the developing world (Schwartzstein 2020).

company, for example. Primo is a commercial drinking water firm that provides direct delivery to home and business dispensers, operating self-service kiosks across North America and Europe. Consumer distrust of tap water is central to Primo's appeal to consumers.

Primo's advertising explicitly appeals to health concerns and stokes consumer fears about the quality of tap water. The company's slogan is "Drink Big. Drink Healthy," and in 2021 visitors to Primo's website were greeted with the words "HEALTHIER LIVES THROUGH HEALTHIER WATER" and "Drinking safer water should be a no-brainer." The advertisements that adorned water kiosks operated by the Primo company in Houston raised the specter of tap water contamination with the image of a rusty pipe. "Your tap water can hang out in some pretty seedy joints," the Primo sign warned consumers. "It's time to rethink your water." The advertisement's appeal to consumer fear was notably larger than its claims about the Primo kiosk's "9-step purification process." Commenting on the design of a commercial water kiosk, columnist Thomas Hine (1995) observed, "In a subtle way, this machine tells people that safe water is something that has to cost extra. Rather than spur improvement in public water, which might result in higher water rates, consumers prefer to make sure their own water is pure."

More than mere marketing, distrust of tap water born of failing infrastructure is key to Primo's corporate growth strategy. In 2019, Primo's filings with the Securities and Exchange Commission (SEC) told its investors,

*The water and wastewater infrastructure in the United States and Canada was given a D- grade by the American Society of Civil Engineers in 2017. Trillions of dollars will be required to bring water treatment and drinking water distribution into compliance with applicable laws and standards over the next twenty years. In addition, many sources of drinking water are now contaminated with known and emerging contaminants which will likely require sophisticated water treatment technologies to render tap water safe. Providing safe drinking water now will fall to forward thinking companies such as Primo who not only provide water that consumers trust but also provide products that align with a sustainable, environmentally friendly business model.*⁷

⁷ Primo Water Corporation, 2019 Proxy Statement, Securities and Exchange Commission Schedule 14A (italics added).

In identifying the company's competitive strengths, Primo's 2021 SEC filing declared that consumer "concerns about deteriorating municipal water quality" represented the company's principal "new growth opportunity."⁸ In discussing Primo's competition and threats to its market share, the same filing noted that "consumers may choose to drink from municipal water sources instead of purchasing bottled water." Ironically, the filing noted that Primo relies on municipal water for its supply.⁹

In 1984, a group of commercial water industry leaders established the Drinking Water Research Foundation (DWRF).¹⁰ The innocuously named foundation's stated mission is to "conduct research and disseminate information regarding the sources, evaluation and production of safe and affordable drinking water, including bottled water, tap water and filtered water." With less than \$300,000 in assets and annual revenue of less than \$120,000, the DWRF apparently conducts little or no scientific research.¹¹ Rather, the DWRF issues press releases defending the commercial water industry and tracks news on legislative and regulatory developments related to commercial water. The foundation's website, thefactsaboutwater.org, publishes press releases, provides "expert views" on bottled versus tap water, and offers links to a carefully curated set of published scientific studies on the health benefits of hydration and health risks associated with tap water.¹²

⁸ Primo Water Corporation, 2021 Proxy Statement, Securities and Exchange Commission Schedule 14A, p. 5.

⁹ Primo Water Corporation, 2021 Proxy Statement, Securities and Exchange Commission Schedule 14A, p. 8. The same filing identified threats to municipal water sources as a risk factor that could hurt the company's financial performance: "[I]f any of our municipal water sources were curtailed or eliminated as a result of, for example, a natural disaster, work stoppage, or other significant event that disrupted water flow from such municipal source, we may have to purchase water from other sources, which could increase water and transportation costs" (p. 14).

¹⁰ The Drinking Water Research Foundation of Alexandria, Virginia, is unrelated to the similarly named Water Research Foundation of Denver, Colorado.

¹¹ Google Scholar searches conducted at the time of writing yielded just one published study linked to the Drinking Water Research Foundation: a nonrefereed edited volume entitled *Safe Drinking Water: The Impact of Chemicals on a Limited Resource* (Rice 1985). The volume includes a chapter entitled "Bottled Water: An Alternative Source of Safe Drinking Water" by Jerry T. Hutton, vice president of food and drugs company Foremost-McKesson.

¹² The most-cited expert on thefactsaboutwater.org is Jack West, a bottled water industry consultant and chairman of DWRF's board of trustees.

On one hand, the DWRF declares bottled water to be “a safe and healthful alternative to other beverages,” with a seal to ensure that “the safety of the water is uncompromised.” On the other hand, “the quality of tap water depends mainly on factors outside the consumer’s control.” The DWRF is not so much a research enterprise as it is an advertisement for commercial water and an investment in doubt about tap water quality – all with a scientific veneer.

Just as the builders of the American state made their political fortunes on trust in tap water, much of the commercial water industry’s profit springs from distrust in tap water. Some commercial water companies specifically target racial and ethnic groups in their marketing, capitalizing on distrust in government institutions – a practice that we examine further in Chapter 6. In the United States, commercial water success depends on encouraging and capitalizing on distrust in tap water – a collective service regulated by and mainly provided by government. Sowing distrust in tap water means growing distrust in government.

The Argument in Brief

Trust or distrust at the tap has far-reaching consequences for governance writ large. Chapter 2 elaborates the logic that connects basic services to government trust and legitimacy, grounding each step in existing research; here, we briefly summarize the core argument as applied to drinking water.

Trust has two main dimensions: *competence* and *morality*. People trust government’s competence when they believe that government leaders and employees are capable of carrying out public policy effectively; we call this *performative trust*. People trust government’s morality when they believe in the basic benevolence of government leaders and employees; we call this *moral trust*. Belief in government’s competence and morality contributes to trust in government, whereas perceived government ineptitude or malevolence drives distrust. To be trustworthy, it is not enough for governments to produce qualitatively good outcomes (e.g., my tap water is good and affordable); government administration also must be procedurally fair, respectful, and honest (e.g., my utility communicates clearly and respects me).

Wellsprings of (Dis)trust

Three main factors account for a citizen-consumer’s trust or distrust of government. First, *lived experiences* with and observations of

government affect trust. People who enjoy benefits from government programs and services tend to trust government insofar as they recognize that government provides these benefits. Trust operates both directly (e.g., I trust my tap water because it is safe, reliable, and tastes good) and indirectly (e.g., I trust my tap water because my city's libraries, police, and fire departments are good). Second, public *agency reputations* contribute to trust in government. Reputations are widespread beliefs about government agencies' technical acumen, past performance, ethics, and fairness. Reputations emerge from politicians' and mass media depictions of government agencies and their work. Third, a person's trust in government is partly a function of his own *identity*. Members of social groups that enjoy privileged status or sizable political influence are inclined to view government institutions as benevolent and competent. Individuals from politically marginalized groups are likely to be more skeptical about government's intentions. Objective conditions are thus evaluated through a lens of identity. People who share racial, ethnic, socioeconomic, or other elements of social identity with victims of government failure will perceive government failure elsewhere as confirmatory evidence that government itself is untrustworthy.

Citizen-consumers who are dissatisfied with the quality of government service provision may either *voice* their concerns to officials in hopes that governments will improve conditions or *exit* by purchasing goods or services from commercial firms. The choice between voice and exit turns on the citizen-consumer's expectations about the effectiveness of her voice and the cost of commercial alternatives. If distrust arises from government incompetence, then the citizen-consumer may rationally respond with voice. Citizens may be dissatisfied with outcomes but nonetheless maintain faith in the moral decency of government as an institution. In such cases, citizens may voice concerns through the political process in hopes of improving conditions. However, if the citizen-consumer distrusts government's basic morality, then she distrusts government as a political institution and will always exit for available commercial alternatives. Indeed, distrustful citizen-consumers who exit for commercial providers may oppose efforts to improve government services because such efforts are seen as costly and futile. The citizen-consumers most distrustful of government will abandon government providers for commercial providers rather than demanding improved service or regulatory enforcement from government.

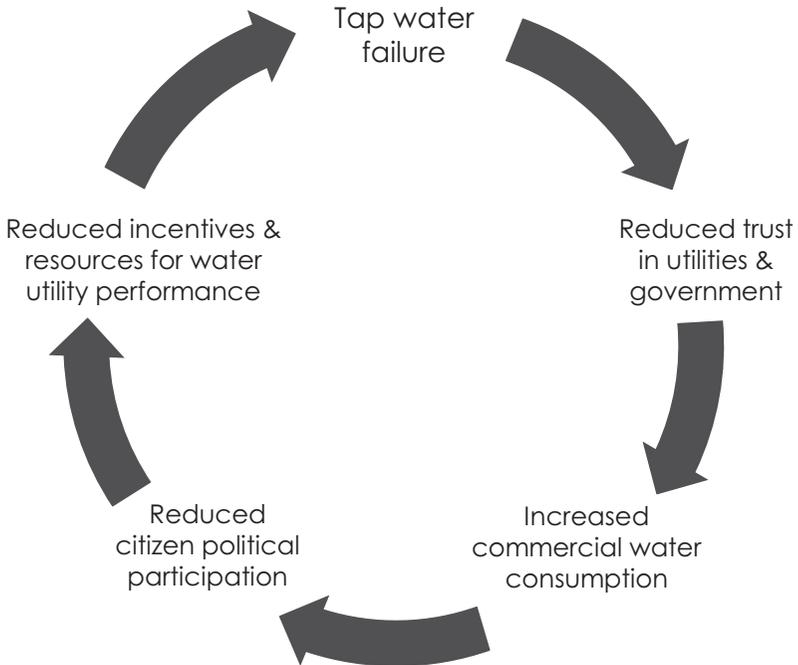


Figure 1.8 The vicious cycle of distrust in tap water.

Note: This water-specific model depicts the vicious cycle of distrust, and recurs throughout the book as a conceptual model. In Chapter 2 we introduce a version of this model that applies to all basic services.

A Vicious Cycle

When tap water failures occur – locally, regionally, or nationally – citizen-consumers abandon utilities in favor of commercial water, with the most distrustful and politically marginalized people most likely to opt for bottled water. Already politically weak, marginalized citizen-consumers have less to gain from engagement with the state and thus withdraw from political participation and civic life more generally as they exit to private alternatives. Politicians have little reason to respond to the demands of populations who do not participate in politics. As citizen-consumers withdraw from civic life, the government agencies that produce and/or regulate water have weaker incentives and fewer resources to provide excellent water utility service. With less oversight, a less active citizenry, and fewer resources, water utility service quality continues to erode: Tap water failures become more common, trust declines further, and a feedback sets in. Distrust becomes alienation, and the perception of government failure becomes

self-fulfilling. Figure 1.8 depicts this vicious cycle of distrust and serves as a conceptual model that recurs throughout the book.

The Profits of Distrust

As this vicious cycle proceeds, private firms capture profits in the form of a *distrust premium*, paid by citizen-consumers who believe that governments provide inferior service. In the case of drinking water, the distrust premium is readily observable in the vast volumetric price differences between tap water and its commercial alternatives. Commercial growth and profit depend in large part on the size and scope of that perceived gap in quality. Charges of poor or inequitable government service, valid or not, will find their most receptive audience among the politically marginalized, so citizen-consumers who distrust government readily pay the distrust premium. In the case of water, commercial water companies stoke fears about tap water quality and assert the superior quality of bottled and kiosk water to attract consumers – especially among the poor and members of racial and ethnic minority groups. The private firms that provide alternatives to government goods and services have strong incentives to rub raw the sores of distrust.¹³

A Virtuous Cycle?

Fortunately, this vicious cycle can also be virtuous. Just as failure and distrust lead to exit and cynicism about government, trust can lead to engagement with and support for better government. In the tradition of Putnam's (1993) classic work on the political effects of social capital, we argue that the quality of basic services drives trust in the institutions of government, which leads to greater public engagement, which in turn leads to better government performance. Drinking tap water is a sign of trust in government: The citizen who drinks from the tap implicitly entrusts her health to the agencies that provide and/or regulate her water. Reliant on tap water and trusting in the institutions of government, she will support investments in public water utilities and demand quality from politicians and managers. Buoyed by or at least mindful of those demands, regulatory officials and utility operators will fulfill that trust with the high-quality water and sewer services that helped establish the legitimacy of the state more than a century ago.

Basic services are the foundation of state legitimacy. In the book's last two chapters, we show that the vicious cycle in Figure 1.8 can turn

¹³ With apologies to Saul Alinsky.

virtuous, with excellent basic services building trust in the institutions of government and fueling greater citizen engagement. For visionary political leaders, then, rebuilding American civic life starts with literally rebuilding the infrastructure that sustains life.

Plan of the Book

This has been a brief introduction to the argument that we develop and support in the chapters ahead. Chapter 2, “The Profits of Distrust,” presents our argument in detail, tracing the logics of consumer behavior, public administration, psychology, and politics that drive the profits of distrust. Chapter 2 is concerned mainly with theory, generalizing the conceptual model in Figure 1.8 beyond drinking water to all basic services. Rooted in scholarship across multiple disciplines, Chapter 2 is aimed mainly at scholars; the chapter culminates in a series of hypotheses linking basic service problems to trust in government, citizen-consumer behavior, and citizen political participation. Readers who are chiefly interested in drinking water and less interested in social scientific theory may safely skim Chapter 2 or proceed directly to the empirical chapters that follow.

Chapters 3–7 lay out the empirical evidence for our claims about the relationships between service quality, trust in government, commercial markets for government alternatives, and politics. Each of these chapters opens with an anecdote that illustrates our argument and connects the chapter’s substance to the broader conceptual map in Figure 1.8. Analysis of data on drinking water, consumer behavior, public opinion, and political participation in the United States follows in each of these chapters. The empirical investigation starts in Chapter 3, “(Dis)trust at the Tap,” which explores the relationship between tap water quality and performative trust. We show that people who experience problems with their drinking water trust government less, and that failures in tap water provision predict local commercial water demand.

Chapter 4, “Hyperopia and Performative Trust,” continues the exploration of performative trust with an analysis of the relationship between water quality compliance and the prevalence of commercial drinking water kiosks. Spatial analysis shows that the effects of tap water failure on public trust transcend political and service area boundaries. In other words, tap water problems in one place affect citizen-consumer perceptions of tap water in other places. Distrust at the tap is

contagious, particularly among low-income populations and members of racial and ethnic minority communities. For the politically marginalized, tap water failure anywhere undermines trust everywhere.

In Chapter 5, “Speaking Up or Opting Out,” we demonstrate the individual citizen-consumer logic at the heart of our argument. Citizen-consumers who are dissatisfied with their tap water may complain to their utilities in an effort to improve service (i.e., voice) or buy commercial drinking water instead (i.e., exit). We show that low-income Black and Hispanic individuals are less likely than higher-income white and non-Hispanic people to voice their discontent with tap water to governments. Drawing on data from multiple public opinion surveys and nationwide bottled water sales data, we show that distrust in government predicts “exit” from tap water to the commercial drinking water market. Crucially, we also find a marked demographic and socioeconomic skew to these patterns of distrust and exit: Low-income and nonwhite people are most likely to opt for commercial drinking water. We then show that this choice of “exit” over “voice” extends to broader political participation – as bottled water sales rise, voter turnout declines.

Chapter 6, “Geographies of Alienation,” focuses on patterns of political marginalization and drinking water behavior that emerge in three parts of the United States. Analysis of water kiosk locations and bottled water sales shows that kiosks are disproportionately located in areas where significant portions of the population have been politically marginalized through decades – or even centuries – of institutional bias or neglect. Exactly which populations are politically alienated varies across this diverse country; this chapter explores three of them: Blacks in the American South, rural populations in Appalachia, and Hispanics in the Southwest.

The analysis comes full circle in Chapter 7, “When Trust Pays.” We show that political support for public investment in water infrastructure is greater among people who drink tap water and lower among commercial water drinkers. Utilities thus benefit from greater public support when citizen-consumers trust government enough to drink deeply from their taps. The payoff to citizen-consumers comes in the form of better performance: Utilities comply with tap water quality rules where voter turnout is higher.

The book concludes by linking basic services – in our case, the humble, ubiquitous pipes that lie beneath our city streets – to

foundational principles of government. The rise of commercial water and concomitant decline of trust in government reveal something essential about the relationship between citizen and state. If governments establish their legitimacy by ensuring the basic security, health, and welfare of their people, then maintenance of these basic services is a key to maintaining state legitimacy. The rise of commercial water in America is a subtle but persistent sign that Americans do not trust their governments. Breaking the cycle of distrust and restoring institutional legitimacy require restoring public confidence in government's ability to provide for basic services. Chapter 8, "Basic Services and Rebuilding Legitimacy," offers a series of guidelines for restoring faith in the promise of democracy through excellence, openness, and equity in basic services. To that end, we close the book with "The Plan," a set of practical reforms to improve water service in America, and so to restore faith in the promise of democracy.