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CHAPTER 14
Taxation as Nudge: The Failure of Anti-obesity Paternalism

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Paternalistic policymakers intend to improve social welfare by implementing a set of prescriptive policies designed to remedy systematic mistakes individuals make. In recent years, some paternalists[1] have relied increasingly on findings of behavioral economics research—a rapidly growing discipline that studies individuals' systematic biases—to justify paternalistic policies. The paternalists focus on devising "nudges" (soft paternalism) or "shoves" (hard paternalism) that steer individuals toward choices more in sync with the individuals' best interests. In effect, paternalists argue that policymakers can exploit individuals' departures from rationality in ways that correct what paternalists see as irrational individual mistakes. The paternalists aim to fix individual failures by introducing interventions devised by better-informed, benevolent policymakers.

Proponents of paternalistic policies attempt to use findings from behavioral economics research to demonstrate how cognitive biases and bounded self-control prevent individuals from maximizing their welfare (Rizzo and

Whitman 2009). Paternalists argue that individuals know what they want but too often fail to achieve their goals. Hence, paternalists advocate government policies that help individuals overcome their biases to achieve self-defined well-being.

Paternalists believe that the evidence supporting behavioral economics justifies expanding the scope of government intervention beyond regulating market failure and into regulating individual failure. The implications of this broader regulatory scope could be far reaching. If individual failure becomes an accepted motive for government intervention, policies are likely to become more intrusive and restrictive than present regulatory policies are. Paternalistic policies motivated by behavioral economics thus warrant a close examination. In this chapter, we examine the growing use of behavioral economics to justify government intervention regarding obesity. Public health advocates often view the growing prevalence of obesity as proof that many individuals pursue behaviors that are out of sync with their own best interests. That is, obesity is not attributed to choices based on personal preferences but rather to irrational behavior that can be successfully amended via government policy. Paternalistic policies believed to steer individuals toward improved lives via leaner bodies include taxes on so-called unhealthy food, regulations requiring calorie counts on restaurant menus and vending machines, bans on children's toys at fast food restaurants, bans on soda and unhealthy food at schools, and moratoriums on new fast food restaurants.

We argue that the growing use of paternalism to justify government intervention in individual food and lifestyle choices is often misguided and that policies are too easily justified on the assumption that government officials are better informed than the individuals they seek to guide.[2] Our examination demonstrates that government intervention is often ineffective in remedying individual failures and that, in some cases, policies are counterproductive for society. Our arguments are also supported by our examination of the recent tax on sugary drinks adopted in Berkeley, California.

RISING PREVALENCE OF OBESITY

The rising prevalence of obesity in the United States is often referred to as a public health epidemic, because it is associated with so many health problems, including diabetes, hypertension, high cholesterol, heart disease, stroke, sleep apnea, some cancers, gallstones, gout, asthma, and osteoarthritis (Dixon 2010). In the United States, annual medical spending on treating obesity was

estimated at $168 billion (in 2005 dollars), roughly 16.5 percent of all medical spending (Cawley and Meyerhoefer 2010).

Researchers hypothesize many causes for excessive weight gain, including increased consumption of sugar-sweetened beverages (Malik et al. 2006; Vartanian et al. 2007; Bleich et al. 2009); falling food prices (Chou et al. 2004; Courtamanche and Carden 2008; Cawley 2010); urban sprawl (Zhao and Kaestner 2010); increase in calories consumed away from home (Chou et al. 2004; Larson et al. 2009); food engineering that encourages food addiction (Ruhm 2010); sedentary lifestyles fostered by technology (Philipson and Posner 2003; Lakdawalla and Philipson 2009); increased availability of restaurants (Chou et al. 2004; Larson et al. 2009); fewer grocery stores selling healthy foods (Larson et al. 2009); and agricultural policies that encourage production of unhealthy foods (Wallinga 2010).

Whether directly or indirectly, most of these studies point to individual failures—biased reasoning or lack of self-control—as the main causes of obesity. A recent *New England Journal of Medicine* article argues that

> Many persons do not fully appreciate the links between consumption of these beverages and health consequences, they make consumption decisions with imperfect information. These decisions are likely to be further distorted by the extensive marketing campaigns that advertise the benefits of consumption. A second failure results from time-inconsistent preferences (i.e., decisions that provide short-term gratification but long-term harm). This problem is exacerbated in the case of children and adolescents, who place a higher value on present satisfaction while more heavily discounting future consequences. (Brownell et al. 2009, 1601)

Traditional economic theories assume that people are rational, that they know exactly what they want, and that they choose the best way to increase their own welfare within the limits of the information at their disposal. As long as people are free to choose, they are believed to achieve the best outcomes for themselves given their circumstances and information. They will also learn from their mistakes. The traditional paradigm is simply to let people manage their own lives, because they are best able to determine their own welfare.

A discipline at the intersection of psychology and economics, behavioral economics examines whether people make rational choices under various economic scenarios. Behavioral economists challenge the traditional view by documenting numerous instances in which individual actions demonstrate *bounded rationality* (see Ariely 2008 and McKenzie 2009 for numerous examples). Not only do individuals make mistakes in their decision-making, but they are also believed to repeat the same mistakes under similar conditions. Behavioral economists assert that, rather than some people making random irrational choices, individuals frequently deviate from rational decisions in consistent and predictable manners. In other words, choices are systematically biased.

Systematic bias in human behavior falls into two broad categories (Buckley 2009). First, *cognitive biases* prevent people from pursuing actions that improve their welfare. Individuals rely on heuristics or rules of thumb when making decisions, which may lead them to less optimal decisions. For example, patients are more likely to opt for a surgery if the outcome probability is framed in terms of success rate rather than failure (Tversky and Kahneman 1981).

In the second category, behavioral economists question individuals' willpower to choose rational courses of action. In economic jargon, such individuals are said to suffer from *hyperbolic discounting* that leads them to exhibit time inconsistency. For example, while individuals might strive toward quitting smoking, an inconsistency exists between this long-term objective and their short-term behavior that results in time-inconsistent choices. A smoker may find it hard to quit today, but may decide to quit tomorrow when the benefits of better health outweigh the costs of quitting. Yet, when tomorrow arrives, the individual reverses this decision when he believes the costs of quitting outweigh benefits. Consequently, the individual finds it exceedingly difficult to quit smoking. The same logic applies to an obese person trying to stick to a diet or an exercise program. In effect, individuals are believed to suffer from persistent difficulties in self-control.

Seemingly irrational behavior prompts many public health advocates to call for government intervention on behalf of obese citizens. Local, state, and federal governments have responded by issuing policies aimed at curbing individual failures. Policies range from highly stringent (e.g., bans or taxes on unhealthy foods) to less intrusive (e.g., food labeling requirements and public service announcements that exercise is helpful). As discussed below, these measures have achieved little to no success.

GOVERNMENT INTERVENTION IS INEFFECTIVE

For most of the twentieth century, regulation was used to correct market failures. Consequently, a standard government regulatory toolkit was developed to deal with these types of market failure. This toolkit contains two approaches to deal with market failure. The first approach requires information disclosure to counter information asymmetry. The second approach increases the cost of "bad" behavior to deal with negative externalities.

Paternalistic policymakers have used both approaches in attempts to deal with obesity. Federal, state, and local governments have required food producers and servers to disclose calorie counts, sugar and fat contents, and other information to steer consumers toward healthier choices. Regulations are based on the assumption that consumers are poorly informed about the negative effects of their choices and that fuller disclosure will remedy the problem of information asymmetry. Some governments press even further by imposing higher taxes on or banning various unhealthy foods altogether. This heavy-handed approach presumes consumers lack sufficient incentives to watch what they eat or exercise to maintain healthy weight. Paternalists thus attempt to selectively punish such behavior by increasing the cost of unhealthy choices—not unlike policies aimed at correcting such negative externalities as pollution. However, government policies designed to remedy market failures are ineffective in mitigating the consequences of individual failures.

Obese People Do Not Suffer from a Lack of Information

Obesity may be a widespread problem, but it does not necessarily result from a lack of information. Studies indicate that adults recognize various personal health risks associated with obesity. Finkelstein et al. (2008) conducted a survey of 1,130 adults in the United States to test whether overweight and obese individuals believe they are at greater risk of obesity-related diseases and premature mortality. They found that overweight and obese adults forecast life expectancies that are 2.4 and 3.9 years, respectively, shorter than those of normal-weight adults. Excess weight was associated with greater self-perceived risk of developing diabetes, cancer, heart disease, and stroke. The authors concluded that mortality predictions generated from the survey were reasonably close to those generated from actual life tables for adults in the United States. These results are consistent with the findings of Falba and Busch (2005) that overweight and obese adults predict they will have shorter life expectancies. Examining data on 9,035 individuals aged 51 to 61, they found that overweight

and obese adults believe their weight will reduce their life expectancy by an average 2.5 years and 4 years, respectively.

Thus, recent interventions are relatively ineffective when they simply repeat information individuals already know. A study of New York City's 2008 law requiring restaurant chains to post calorie counts examined how menu calorie labels influenced fast food choices. Information provided by patrons of fast food restaurants in New York City was compared with information provided by patrons in Newark, New Jersey, a city without labeling laws. While 28 percent of New York patrons said the information influenced their choices, researchers could not detect a change in calories purchased after the law (Elbel et al. 2009). Finkelstein et al. (2011) reached a similar conclusion in a study of a mandatory menu-labeling regulation requiring all restaurant chains with fifteen or more locations to disclose calorie information in King County, Washington. No effect on purchasing behavior—measured by transaction trends and calories per transaction at one fast food restaurant chain—was found.

Obese People Do Not Suffer from Lack of Motivation

The obese do not lack economic motivation to watch their weight. Individuals making poor food choices have strong incentives to correct them. Obese individuals generally want to lose weight for reasons that may include better health, longer life span, and higher wages. For example, it is well known that the obese earn less than the nonobese. Baum and Ford (2004) conclude that both men and women experience a persistent obesity wage penalty during the first two decades of their careers. After controlling for various socioeconomic and familial variables, they also find that standard covariates do not explain why obese workers continue to experience persistent wage penalties. They suggest that job discrimination, health-related factors, or obese workers' behavior patterns may explain why obesity continues to adversely affect wages.

Obese individuals' income loss can be substantial. Cawley (2004) found that obese white females earned 11.2 percent less than their nonobese counterparts. A difference in weight of two standard deviations (roughly 65 pounds) was associated with a 9 percent difference in wages—an effect equivalent to the wage effect of roughly 1.5 years of education or 3 years of work experience. Bhattacharya and Bundorf (2009) find that cash wages for obese workers are lower than those for nonobese workers, because the employers' costs for providing health insurance to obese workers is higher. Obese workers who receive employer-sponsored health insurance pay for their higher medical costs by receiving lower cash wages than nonobese workers.

Recent evidence also calls into question interventions aimed at steering obese individuals away from junk and fast food. Van Hook and Altman (2012) recently concluded that children with access to junk food (e.g., soft drinks, candy bars, potato chips) were no heavier than those without. The study followed nearly 20,000 students from kindergarten through the eighth grade in 1,000 public and private schools and found that in the eighth grade, 35.5 percent of children in schools with junk food were overweight, while 34.8 percent of those in schools without it were overweight. The authors suggest that children's food preferences and dietary patterns may be firmly established before adolescence. The evidence thus offers little support for anti-obesity interventions aimed at stopping junk food consumption in middle school. The authors conclude that food sales in schools are, on average, unrelated to obesity; this result supports other research that school-based interventions to reduce childhood obesity are often unsuccessful (Sharma 2006; Kropski et al. 2008).

Anderson and Matsa (2011) found that the causal link between the consumption of restaurant foods and obesity is minimal at best, based on an examination of data collected between 1990 and 2005. Analyses of food intake data revealed that, although restaurant meals were associated with greater caloric intake, additional calories were mostly offset by reductions in eating during the rest of the day. They concluded that efforts to reduce fast food consumption might be ineffective in lowering obesity, because consumers may overturn such efforts by substituting other foods or simply eating more food at home. In other words, unhealthy food or even overindulgence of healthy food does not require ready access to fast food restaurants when grocery stores and full service restaurants are available.

GOVERNMENT INTERVENTION IS COUNTERPRODUCTIVE

Paternalistic policymakers often possess insufficient information required for effective policymaking (Rizzo and Whitman 2009). Advocates of government paternalism often assume that a government official is not only fully rational but also fully informed and committed to improving the welfare of others. Yet dealing with individual failures requires not just general knowledge (e.g., health impact of trans fats) but also very specific knowledge of individual circumstances and preferences dispersed across society (e.g., when individuals are more likely to consume unhealthy foods, how a government policy would interfere with their private weight loss initiatives). Absent such information, policies initiated by paternalists are likely to be misguided and ineffective.

Paternalistic policies may also lead to unintended consequences, which may, on balance, hurt the people such policies were meant to help. And even if paternalists proposed policies that could remedy individual failures, it is unlikely those policies would survive the policymaking process intact.

Unintended Consequences

The burdens of government policies are borne not only by those citizens who are believed to lack sufficient information or self-control. Research demonstrates that tax hikes on alcohol and tobacco serve primarily to decrease consumption by light, not heavy, users. In other words, raising taxes causes those without problems to reduce consumption, leaving those with problems to simply pay higher taxes (Ayyagari et al. 2009). There is little reason to suspect anything different when taxes are imposed on individuals believed to eat too much and exercise too little. Taxes more heavily steer elastic, not inelastic, consumers away from taxed products, exerting little to no effect on those citizens regulations actually target. Such interventions are also often regressive in nature, placing higher burdens on the poor rather than the non-poor (Hoffer et al. 2015).

Interventions may also impose adverse unintended consequences on public health. Tax hikes on cigarettes harm smokers, for example, who switch to higher tar and nicotine brands to smoke fewer, but more addictive, cigarettes (Farrelly et al. 2004; Adda and Cornaglia 2006). Epidemiological research indicates that outcomes of such smoking patterns are more detrimental to health (Thun et al. 1997). One study found that teen marijuana consumption rose following state tax increases on beer, indicating that policies targeted at one problem (excessive alcohol consumption) may also affect other problems (youth marijuana consumption; DiNardo and Lemieux 2001). Chou et al. (2004) found that higher cigarette prices stemming from tax hikes reduce smoking but also are associated with higher rates of obesity—again suggesting that policies aimed at correcting some individual failures (smoking) can unintentionally promote other individual failures (obesity).

Rent-Seeking

Beyond unintended consequences, paternalistic policies open up a new area of private activity to special interest and lobbying influence in the legislative context. When policymakers decide which products or technologies should

dominate a market, they boost some industries at the expense of others. Consequently, industries affected by paternalistic policies have a strong incentive to shape policies to their own benefit. Yet paternalists often forget that policymaking itself is a political process. Paternalistic policies are not crafted by benevolent, perfectly rational, fully informed bureaucrats. Rather, they are the product of highly contentious political processes in which competing interests collide on a range of issues. The final compromise may be far from the most efficient course of action.

For example, the federal school-lunch program classified pizza as a vegetable, because it contained tomato paste (Tomson 2011). Attempts by the Department of Agriculture to replace pizza with more vegetables were blocked in Congress by legislation attached to a 2012 appropriations bill.[3] The same bill proposed to block the USDA from implementing new guidelines that would require more whole grains in school food while cutting sodium and starchy vegetables like potatoes.

SODA TAXES AS NUDGES

Berkeley's tax on sugary drinks demonstrates the various concerns with the paternalistic government policies aimed at changing consumer behavior. When economists discuss the use of taxes to change behavior, they typically focus on the traditional economic mechanisms: taxes increase the price of a product and consumers react to the higher prices by reducing consumption of that product (see, e.g., Wang et al. 2012). Proponents of taxing "bad" foods like sodas or snacks often justify their policies using this traditional economic argument after complaining that food companies entice consumers to eat unhealthy food by making junk food too cheap (Thompson 2010). Moreover, some health advocates also argue for soda or junk food taxes to raise consumer awareness about the harmful nature of sugary drinks (Oatman 2012).

More recently, some health advocates have begun to argue for taxing "bad" foods by appealing to behavioral economics (Clark 2014). There are several ways in which a soda tax might work as a nudge.[4] First, taxes may act as a reminder to consumers who are often believed to be overwhelmed by the many attributes of food—quality, price, expiration dates, discounts—that they should be choosing healthier options. Most consumers' shopping behavior is believed to be driven by habit, and this automatic behavior can override explicit plans to choose healthier options (Marteau et al. 2012).

Second, taxes may act as a micro-incentive. One of the most striking findings in behavioral economics is that assigning even small costs to particular choices can have extraordinarily large impacts on overall outcomes. For example, one study found that placing junk food in the back of the school cafeteria considerably reduces consumption of junk food (Hanks et al. 2012). Thus, imposing a trivial cost on a particular choice—walking a few extra steps to reach the junk food—may result in a substantial impact on consumers' food choices.

Third, taxation may change consumer behavior by appealing to social norms. For example, the energy analytics company Opower teams up with utility companies to provide feedback to customers on their energy usage and the energy usage of their neighbors (Schultz et al. 2007; Allcott 2011). Efficient customers receive an approval message—a smiley face—on their bill. This social comparison combined with an approval message proved to be effective at nudging utility customers to reduce their energy consumption. The tax may act in a similar fashion by conveying an injunctive norm—the public disapproval of soda consumption.

Ironically, behavioral economics also suggests that appealing to social norms may actually backfire. Consumers who perceive being manipulated or forced into specific choices may react by increasing the undesirable behavior. This is what psychologists call reactance (Brehm and Brehm 1981). For example, Opower had discontinued the use of a frowny face as a disapproval message for the least efficient users after receiving numerous customer complaints (Stern 2013).

The public backlash to New York City's attempt to ban large soda containers is another example of reactance that might also increase soda consumption rather than decrease it (Wansink and Just 2012). For example, one behavioral simulation study examined whether a sugary drink limit would still be effective if larger-sized drinks were converted into bundles of smaller-sized drinks (Wilson et al. 2013). Study participants were offered varying food and drink menus. One menu offered 16 oz, 24 oz, or 32 oz drinks for sale. A second menu offered 16 oz drinks, a bundle of two 12 oz drinks, or a bundle of two 16 oz drinks. A third menu offered only 16 oz drinks for sale. The method involved repeated elicitation of choices, and the instructions did not mention a limit on drink size. Participants bought significantly more ounces of soda with bundles than with varying-sized drinks. Total business revenue was also higher when bundles rather than only small drinks were sold.

Discussion: Berkeley's Sugary Drink Tax

On November 2014, Berkeley, CA, became the first city in the United States to impose a specific tax on sugary drinks (Mandaro 2014). Tax proponents argued for the measure using a mix of traditional and behavioral economic rationales.[5] For example, proponents cited various studies that used the traditional economic framework to estimate how much soda consumption would decrease in response to a higher price. But advocates also viewed the tax and its associated media campaign as instruments to raise public awareness of soda's adverse impact on health.

Specific implementation of the tax is notable for three reasons.[6] First, the tax is imposed on the distributors of sugary drinks and not directly on consumers, though most media outlets referred to it as a sales tax. Under California's constitution, local government cannot impose sales taxes on food on top of taxes already imposed by the state. However, local jurisdictions have the power to impose business license taxes on businesses operating within their limits.[7] Consequently, the city of Berkeley imposed the tax on soda distributors with expectations that they would pass the tax on to consumers (Brockett and Rose 2014).

Second, tax revenues accrue to Berkeley's general fund and are not earmarked for health programs. The designation of the tax revenues was an important issue during the campaign for the tax; tax proponents wanted all revenues to be used by health programs in the city (see Crowley and Hoffer, chapter 6, this volume, for a further discussion of earmarking tax revenue). However, earmarking tax revenues in this manner would have turned it into a special tax as opposed to a general tax whose revenues can be used for any purpose. While both special and general taxes have to be approved by voters, a special tax requires a two-thirds majority approval, whereas the general tax requires only a simple majority. Concerned with a higher approval threshold, the city council proposed the soda tax as a general tax while promising to use all revenues for health programs (Siler 2014). Interestingly, these concerns proved to be groundless, as voters approved the tax by an overwhelming 76 percent majority.

Finally, the sugary drink tax contains numerous exceptions that include exemptions for various drinks, such as fruit juices and milk, that may also have high sugar content. The council justified its exemptions on the grounds that these exceptions provide substantial nutritional value. The tax also exempts small businesses; it only applies to soda deliveries to stores with more than $100,000 in annual revenues.[8]

The Unclear Connection between Sugar and Obesity

Proposals for taxing soda presume that soda consumption is a leading source of sugar in the United States. But the Centers for Disease Control and Prevention (CDC) state that the majority of our sugar calories come from food, not beverages. Moreover, the CDC concludes that consumption of added sugars in the United States decreased from 1999–2000 to 2007–2008, primarily because of a reduction in soda consumption (Welsh et al. 2011). The authors state that, although the driving force behind the reversal in the trends in added-sugar consumption is unknown, it is undoubtedly multifactorial and may include rational changes in consumer preferences as well as government efforts to promote healthier diets.

Other research also indicates that sales of full-calorie soft drinks have been declining in part because soda makers are meeting growing consumer demands for more no-calorie and low-calorie options. Evidence on youth consumption trends is particularly enlightening. Between the 2004 and 2009 school years, the beverage industry reduced calories shipped to schools by 90 percent; on a total ounces basis, shipments of full-calorie soft drinks to schools decreased by 97 percent (Wescott et al. 2012). Availability of beverages sold from vending machines and student access to sugar-sweetened beverages has steadily decreased since the 2006–2007 school year (Turner and Chaloupka 2012). Again, it is likely that reasons for this shift are multifactorial.

A recent systematic review of the evidence for an association between sugar-sweetened beverages and risk of obesity also indicates room for caution when it comes to assigning blame for obesity prevalence to soda (Trumbo and Rivers 2014). Sugar-sweetened beverages are the fourth-highest contributor of calories in the diets of the general US population, with grain-based desserts, yeast breads, and chicken and chicken-mixed dishes being the top three contributors. The authors conclude that it remains unclear how sugar-sweetened beverages contribute to caloric intake and, possibly, obesity in a manner that would be different from these top three contributors.

Another study examined whether fructose consumption in the United States has increased sufficiently to be a causal factor in the rise in obesity prevalence (Carden and Carr 2013). Data indicate that total fructose availability in the United States did not increase between 1970 and 2009, and thus, was unlikely to have been a unique causal factor in the increased obesity prevalence. The authors concluded that increased total energy intake due to increased availability of foods providing glucose (primarily as starch in grains) and fat was a significant contributor to increased obesity.

Moreover, the connection between sugar and obesity is also not so clear. Nutritionists have recently argued that the evidence is not yet convincing that fructose-containing sugars contribute to weight gain more so than other sources of energy in the diet (Choo et al. 2015). In addition to those fructose-containing sugars, other highly palatable aspects of a Western dietary pattern (refined grains, processed meat, red meat, French fries, etc.) also deserve our attention when it comes to theorizing about what foods are causally related to rising obesity prevalence.

Evidence on Soda Taxes

It is not surprising that the effectiveness of soda taxes remains speculative rather than factual, given the lack of evidence of a causal connection between soda and obesity. Tax proponents widely cite Mexico's experience as evidence that taxation causes a substantial reduction in soda consumption (Colchero et al. 2016). In 2014, Mexico imposed a tax of approximately 10 percent that applied to nondairy and non-alcoholic beverages with added sugar. One study reports a 6 percent average decline in purchases of taxed beverages over 2014 compared to pre-tax trends (Colchero et al. 2016). However, even if soda consumption fell by 6 percent, we do not know what Mexicans consumed instead. The authors admit that they cannot quantify any potential changes in calories and other nutrients purchased or their potential health implications. Given the tenuous causal connection between soda consumption and obesity, it remains unlikely that obesity prevalence will be significantly affected.

Many other studies cast doubt on the effectiveness of soda taxes. One study based on state soft drink sales and excise taxes between 1989 and 2006 finds that increases in soda tax rates moderately decrease soda consumption among children, but have no effect on total caloric intake. Children increased their consumption of other high-calorie beverages in ways that completely offset decreased soda consumption (Fletcher et al. 2010b). A recent study using scanner data at grocery stores looked at the effect of two tax events on soft drink consumption: a 5.5 percent sales tax on soft drinks imposed by the state of Maine in 1991, and a 5 percent sales tax on soft drinks levied in Ohio in 2003 (Colantuoni and Rojas 2015). The authors concluded that neither sales tax had a statistically significant impact on the consumption of soft drinks.

Another study estimates the effects of current soft drink taxes on weight outcomes for the U.S. population. The authors find that a one percentage point increase in soft drink taxes decreases adult BMI by 0.003. The authors concluded that even a 58 percent tax on soda would drop the average BMI by only

a trivial 0.16 points (Fletcher et al. 2010a). Another study by the same authors found no evidence that larger tax hikes were any different than smaller tax hikes, reconfirming studies showing little to no effects of current sales tax rates on consumption or obesity (Fletcher et al. 2015).

There is little reason to predict that the Berkeley tax will fare any differently. The tax relies on soda distributors to pass it on to consumers. However, Cawley and Frisvold examined the impact of Berkeley's measure on soda prices and found that only a small fraction of stores passed the tax on to consumers in the manner intended by the city council (Cawley and Frisvold 2015). The vast majority of stores either absorbed the cost of the tax or increased the prices for both diet and regular sodas. Their actions effectively defeat the purpose of the tax to make regular sodas more expensive and to push consumers towards less caloric drinks.

Rent-Seeking

Beyond the questions regarding the effectiveness of soda taxes, there are concerns over the misaligned incentives that policymakers face in using taxes as nudges (Hoffer et al. 2014). Specifically, the incentive to raise revenues lies in direct contradiction with its goal to reduce soda consumption. The goal of the soda tax is to give consumers an additional incentive to choose healthier drinks.

However in its first month, the tax already netted more than $116,000 in revenues.[9] The city expected the measure to bring in around $1.2 million in its first year. In fact, the city council already began apportioning the tax revenues.[10] The city has advanced $500,000 to a newly appointed panel of experts to apportion the revenues to the various health programs. Effectively, the city treats the tax as a source of revenues to finance a variety of programs. Consequently, Berkeley's policymakers have a financial incentive to maintain these tax revenues, despite its purported goal of reducing soda consumption.

The logic of nudges inevitably runs counter to the logic of politics in this case. For the soda tax to work as a nudge, either as a reminder or as a micro-incentive, the tax should be highly visible and cut through the noise of a typical supermarket environment to grab consumers' attention. That is required to make the drink choice salient. Yet, to "reap" the tax revenues, the very same behavioral economic literature suggests the tax should be mostly invisible, based on predictions that consumers underreact to such taxes, thus leading to higher revenues (Chetty et al. 2009).

Berkeley's soda tax is designed to raise revenues. The city imposed the tax on soda distributors, who ultimately decide the degree to which they pass it on to the consumers. Even if the distributors raise soda prices, the increase will be indistinguishable from the usual price volatility of food items. Nothing on the price tag of soda or on a consumer's receipt would indicate that a set part of the cost comes from the tax. One could argue that the less salient tax design is a by-product of constitutional limitations placed by the state on the taxation powers of local governments. Yet the city could easily go around the limitation by posting a sign next to the soda aisle informing consumers of the soda tax. The fact that they chose not to do so suggests their interest is in raising tax revenues rather than improving consumers' choices.

Two other aspects of the soda tax implementation point to it being driven by politics rather than public health. First, the city exempted a number of drinks with high sugar content from the tax. Specifically, the city exempted fruit juices and milk, the drinks that are commonly perceived as "natural," even though sugar has the same impact on weight regardless of its source. The exemptions open the door for political lobbying over what drinks should be considered healthy and which should be exempt from taxation. One need only look at the recent congressional decision to declare pizza a vegetable to see the potential for abuse (Winstead 2011).

Second, the city imposed the tax only on larger stores; the stores with revenues under $100,000 were exempt from the tax. While sparing small businesses is good politics, it hardly serves the needs of consumers who, according to tax advocates, should reduce their soda consumption. There is no theoretical difference in the health impact of sodas purchased from a large store or a small one. If a soda tax were effective in changing consumers' behavior, the small business exemption could have considerably undermined its impact.

Unintended Consequences

Attempts by government to change consumer behavior often backfire. For example, a field study shows that a soda tax led to an initial drop in consumption that was followed by a return to original consumption levels (Wansink et al. 2014). Unexpectedly, the tax also led some consumers to switch to beer—hardly the healthier choice that tax proponents envisioned. Soda taxes have also been shown to steer consumers into consumption of a wide array (twenty-three categories) of other food and beverages (Zhen et al. 2013). A price increase of one half-cent per ounce for sugary drinks reduced caloric intake of those beverages, but subjects quickly compensated by consuming

almost half of those calories in substitutes that were often laden with sodium and fat.

Studies in behavioral economics point to several potential unintended consequences. Consumers who reduced their soda consumption as a result of the tax may reward themselves for the "good" choice by indulging in other caloric foods. For example, a study demonstrates that consumers who purchased a meal at Subway, which is perceived as a healthier fast food restaurant, were less likely to select diet soda with their meal compared to consumers who ate at McDonald's (Chandon and Wansink 2007). Similarly, the mere presence of healthier items on the menu leads consumers to purchase more caloric items (Wilcox et al. 2009).

In addition, the nontaxed status of fruit juices and milk may confer a so-called health halo on these drinks, similar to the effect of "low sugar" or "low fat" health claims (Williams 2005; Wansink and Chandon 2006). Consumers tend to interpret such health claims to mean that the food item is healthy and consequently can be consumed in large quantities. As a result, they tend to overconsume such foods, leading to a higher caloric intake. Since fruit juices are frequently as high in sugar as soda drinks, overconsumption of fruit juice may actually increase consumers' caloric intake.

CONCLUSION

Obesity is a serious health problem. But advocates of paternalistic policies overstate the benefits of intervention, even as they understate the costs. Paternalistic policymakers justify policies all too easily on the assumption that they are better informed than the individuals they seek to guide. Government intervention regarding obesity stems from good intentions; as one recent paper puts it, "after all who can question actions intended to improve health?" (Craven et al. 2012, 39). In this chapter, however, we demonstrate that paternalism, no matter how well intentioned, is a poor guide for policy making and can adversely affect obese and nonobese citizens alike.

It is difficult to argue that obesity results from lack of information. Research indicates that the obese understand the health implications of obesity and its link to poor health and lower incomes. Research also demonstrates that employers have incentives to push employees to lose weight; there is no market failure that requires government intervention. The obese hardly need the government to give additional incentives to lose weight, since lack of motivation does not appear to cause obesity. Interventions focusing on steering them away from particular foods or toward more exercise are thus unlikely to provide new

information or result in much weight loss. These predictions are consistent with research that shows government interventions have little to no effect on obesity. Unfortunately, on realizing that softer interventions are ineffective, regulators are likely to be tempted to turn to harder paternalism.

Somewhat lost in the public health debate is the reality that people who know they are overweight also experience strong personal incentives to lose weight. Individuals' growing demand for weight reduction is evidenced by the market for diet books, health foods, weight-loss centers, exercise equipment, athletic clubs, and other independent weight-control methods. Paternalists appear to disregard market attempts to deal with obesity, since its prevalence offers them latitude to overstate the effectiveness of interventions. Furthermore, this disregard coheres with the paternalistic belief that reduction of obesity prevalence is unlikely sans government intervention.

The case of Berkeley's soda tax is illuminating. The city council advanced the tax as a way to nudge consumers toward less caloric beverages. However, the policy's effectiveness is questionable. The policy is justified based on two assertions. The first assertion is that consumption of sugary drinks causes obesity. The second is that taxing sugary drinks will reduce obesity. Both assertions are unfounded. Little conclusive evidence links sugary drink consumption to obesity. Furthermore, taxing sugary drinks may not reduce soda consumption. Even when it does, consumers frequently switch from soda to other highly caloric foods and drinks. Consequently, a soda tax is unlikely to reduce caloric intake or have any impact on obesity.

Another important issue is the government's misalignment of incentives when it attempts to use taxes to manipulate consumers' choices. The primary goal of the tax as a nudge is to ensure that people switch to other, less caloric drinks, and in doing so, citizens will not actually pay the tax. Yet the tax represents a substantial source of revenue, which the city council has already begun to apportion to finance various programs. As constituencies build up around these programs, the city may experience increasing incentives or pressures to protect soda tax revenues, to the possible detriment of reducing soda consumption.

The way that the city implemented the tax reveals which incentive wins out in the end. For the tax to work as a nudge and incentivize consumers to change their soda consumption habits, it should be highly visible and salient. Yet the city council imposed the tax on soda distributors rather than on consumers and took no steps to make the tax visible and salient to consumers at the point of purchase. Consequently, the tax seems designed to raise revenues rather than change consumer behavior. The tax's numerous exemptions

for certain businesses and categories of drinks also open the door for further political manipulation of the intended goal of the tax—reduced consumption of sugar—and again supports our view that the use of taxes as nudges is not only ineffective but may in fact be counterproductive to public health.

NOTES

1. See, for example, Camerer et al. (2003), O'Donoghue and Rabin (2003), Thaler and Sunstein (2008), Congdon (2011).
2. This is in fact a crucial assumption on the part of paternalists. The paternalist assumes that he or she is better positioned than the subject to evaluate what is good for the subject. Hence, the paternalist substitutes his or her own judgment for the subject's.
3. Consolidated and Further Continuing Appropriations Act of 2012, H.R. 2112, 112th Cong. (2012).
4. For a review of behavioral intervention mechanisms, see Lashawn Richburg-Hayes et al. (2014a,b).
5. The website of tax proponents lists the various reasons to support the tax. See "Frequently Asked Questions," *Berkeley vs. Big Soda*, n.d., http://www.berkeleyvsbigsoda.com/faq.
6. City of Berkeley (2014).
7. Public Health Law & Policy (2011).
8. City of Berkeley (2014).
9. See http://www.mercurynews.com/my-town/ci_28141086/berkeley-soda-tax-first-months-take-116-000.
10. See http://www.berkeleyside.com/2015/05/18/berkeley-soda-tax-raises-116000-revenue-in-first-month/.

REFERENCES

Adda, Jerome, and Francesca Cornaglia. 2006. "Taxes, Cigarette Consumption, and Smoking Intensity." *American Economic Review* 96 (4): 1013–28.

Allcott, Hunt. 2011. "Social Norms and Energy Conservation." *Journal of Public Economics* 95 (9–10): 1082–95.

Anderson, Michael L., and David A. Matsa. 2011. "Are Restaurants Really Supersizing America?" *American Economic Journal: Applied Economics* 3 (1): 152–88.

Ariely, Dan. 2008. *Predictably Irrational: The Hidden Forces That Shape Our Decisions*. New York: HarperCollins.

Ayyagari, Padmaja, Partha Deb, Jason Fletcher, William T. Gallo, and Jody L. Sindelar. 2009. "Sin Taxes: Do Heterogeneous Responses Undercut Their Value?" NBER Working Paper 15124, National Bureau of Economic Research, Cambridge, MA.

Baum, Charles L., II, and William F. Ford. 2004. "The Wage Effects of Obesity: A Longitudinal Study." *Health Economics* 13 (9): 885–99.

Bhattacharya, Jay, and M. Kate Bundorf. 2009. "The Incidence of the Healthcare Costs of Obesity." *Journal of Health Economics* 28 (3): 649–58.

Bleich, Sara N., Y. Claire Wang, Youfa Wang, and Steven L. Gormaker. 2009. "Increasing Consumption of Sugar-Sweetened Beverages among US Adults: 1988–1994 to 1999–2004." *American Journal of Clinical Nutrition* 89 (1): 372–81.

Brehm, Sharon S., and Jack W. Brehm. 1981. *Psychological Reactance: A Theory of Freedom and Control.* New York: Academic.

Brockett, Jennifer, and Loring Rose. 2014. "Berkeley's Measure D: What Distributors, Restaurants and Retailers Need to Know about the Berkeley 'Sugar Tax.'" *Hospitality Law Blog*, November 21. http://www.dwthospitalitylaw.com/2014/11/articles/food-beverage/berkeleys-measure-d-what-distributors-restaurants-and-retailers-need-to-know-about-the-berkeley-sugar-tax/.

Brownell, Kelly D., Thomas Farley, Walter Willett, Barry Popkin, Frank Chaloupka, Joseph Thompson, and David S. Ludwig. 2009. "The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages." *New England Journal of Medicine* 361 (16): 1601.

Buckley, Francis. H. 2009. *Fair Governance: Paternalism and Perfectionism*. New York: Oxford University Press.

Camerer, Colin, Samuel Issacharoff, George Loewenstein, Ted O'Donoghue, and Matthew Rabin. 2003. "Regulation for Conservatives: Behavioral Economics and the Case for 'Asymmetric Paternalism.'" *University of Pennsylvania Law Review* 151 (3): 1211–54.

Carden, Trevor J., and Timothy P. Carr. 2013. "Food Availability of Glucose and Fat, but Not Fructose, Increased in the US between 1970 and 2009: Analysis of the USDA Food Availability Data System." *Nutrition Journal* 12: 1–8.

Cawley, John. 2004. "The Impact of Obesity on Wages." *Journal of Human Resources* 39 (2): 451–74.

———. 2010. "The Economics of Childhood Obesity." *Health Affairs* 29 (3): 364–71.

Cawley, John, and David Frisvold. 2015. "The Incidence of Taxes on Sugar-Sweetened Beverages: The Case of Berkeley, California." NBER Working Paper 21465, National Bureau of Economic Research, Cambridge, MA.

Cawley, John, and Chad Meyerhoefer. 2010. "The Medical Care Costs of Obesity: An Instrumental Variables Approach." NBER Working Paper 16467, National Bureau of Economic Research, Cambridge, MA.

Chandon, Pierre, and Brian Wansink. 2007. "The Biasing Health Halos of Fast-Food Restaurant Health Claims: Lower Calorie Estimates and Higher Side-Dish Consumption Intentions." *Journal of Consumer Research* 34 (3): 301–14.

Chetty, Raj, Adam Looney, and Kory Kroft. 2009. "Salience and Taxation: Theory and Evidence." *American Economic Review* 99 (4): 1145–77.

Choo, V. L., V. Ha, and J. L. Sievenpiper. 2015. "Sugars and Obesity: Is It the Sugars or the Calories?" *Nutrition Bulletin* 40 (2): 88–96.

Chou, Shin-Yi, Michael Grossman, and Henry Saffer. 2004. "An Economic Analysis of Adult Obesity: Results from the Behavioral Risk Factor Surveillance System." *Journal of Health Economics* 23 (3): 565–87.

City of Berkeley. 2014. "Measure D—Impose a General Tax on Distributors of Sugar-Sweetened Beverages." *Election Information: 2014 Ballot Measures*, September 2. http://www.cityofberkeley.info/Clerk/Elections/Election__2014_Ballot_Measure_Page.aspx.

Clark, Christopher James. 2014. "Sugar Taxation: A Healthy Nudge in the Right Direction?" *Huffington Post UK*, July 28. http://www.huffingtonpost.co.uk/christopher-james-clark/sugar-taxation_b_5624785.html.

Colantuoni, Francesca, and Christian Rojas. 2015. "The Impact of Soda Sales Taxes on Consumption: Evidence from Scanner Data." *Contemporary Economic Policy* 33 (4): 714–34.

Colchero, M. Arantxa, Barry M. Popkin, Juan A. Rivera, and Shu Wen Ng. 2016. "Beverage Purchases from Stores in Mexico under the Excise Tax on Sugar Sweetened Beverages: Observational Study." *BMJ* 352: h6704.

Congdon, William J. 2011. *Policy and Choice: Public Finance through the Lens of Behavioral Economics.* Washington, DC: Brookings Institution Press.

Courtamanche, Charles, and Art Carden. 2008. "The Skinny on Big Box Retailing: Wal-Mart, Warehouse Clubs, and Obesity." Mimeo, October 31, Department of Economics, University of North Carolina, Greensboro. http://www.unc.edu/the/archives/courtemanche.pdf.

Craven, Barrie M., Michael L. Marlow, and Alden F. Shiers. 2012. "Fat Taxes and Other Interventions Won't Cure Obesity." *Economic Affairs* 32 (2): 36–40.

DiNardo, John, and Thomas Lemieux. 2001. "Alcohol, Marijuana, and American Youth: The Unintended Consequences of Government Regulation." *Journal of Health Economics* 20 (6): 991–1010.

Dixon, John B. 2010. "The Effect of Obesity on Health Outcomes." *Molecular and Cellular Endocrinology* 316: 104–8.

Elbel, Brian, Rogan Kersh, Vicotria L. Brescoll, and L. Beth Dixon. 2009. "Calorie Labeling and Food Choices: A First Look at the Effects on Low-Income People in New York City." *Health Affairs* 28 (6): 1110–21.

Falba, Tracy A., and Susan H. Busch. 2005. "Survival Expectations of the Obese: Is Excess Mortality Reflected in Perceptions?" *Obesity Research* 13 (4): 754–61.

Farrelly, Matthew C., Christina T. Nimsch, Andrew Hyland, and Michael Cummings. 2004. "The Effects of Higher Cigarette Prices on Tar and Nicotine Consumption in a Cohort of Adult Smokers." *Health Economics* 13 (1): 49–58.

Finkelstein, Eric A., Derek S. Brown, and W. Douglas Eva. 2008. "Do Obese Persons Comprehend Their Personal Health Risks?" *American Journal of Health Behavior* 32 (5): 508–16.

Finkelstein, Eric A., Kiersten L. Strombot, Nadine L. Chan, and James Krieger. 2011. "Mandatory Menu Labeling in One Fast-Food Chain in King County, Washington." *American Journal of Preventive Medicine* 40 (2): 122–27.

Fletcher, Jason M., David E. Frisvold and Nathan Tefft. 2010a. "Can Soft Drink Taxes Reduce Population Weight?" *Contemporary Economic Policy* 28 (1): 23–35.

———. 2010b. "The Effects of Soft Drink Taxes on Child and Adolescent Consumption and Weight Outcomes." *Journal of Public Economics* 94 (11–12): 967–74.

———. 2015. "Non-Linear Effects of Soda Taxes on Consumption and Weight Outomes." *Health Economics* 34 (5): 566–82.

Hanks, Andrew S., David Just, Laura Smith, and Brian Wansink. 2012. "Healthy Convenience: Nudging Students toward Healthier Choices in the Lunchroom." *Journal of Public Health* 34 (3): 370–76.

Hoffer, Adam J., Rejeana Gvillo, William F. Shughart II, and Michael D. Thomas. 2015. "Regressive Effects: Causes and Consequences of Selective Consumption Taxation." Working Paper, Mercatus Center at George Mason University, Arlington, VA.

Hoffer, Adam J., William F. Shughart, and Michael D. Thomas. 2014. "Sin Taxes and Sindustry: Revenue, Paternalism, and Political Interest." *Independent Review* 19 (1): 47–64.

Kropski, Jonathan A., Paul H. Keckley, and Gordon L. Jensen. 2008. "School-Based Obesity Prevention Programs: An Evidence-Based Review." *Obesity* 16 (2008): 1009–18.

Lakdawalla, Darius, and Tomas Philipson. 2009. "The Growth of Obesity and Technological Change." *Economics and Human Biology* 7 (3): 283–93.

Larson, Nicole I., Mary T. Storey, and Melissa C. Nelson. 2009. "Neighborhood Environments: Disparities in Access to Healthy Foods in the US." *American Journal of Preventive Medicine* 36 (1): 74–81.

Malik, Vasanti S., Matthias B. Schulze, and Frank B. Hu. 2006. "Intake of Sugar-Sweetened Beverages and Weight Gain: A Systematic Review." *American Journal of Clinical Nutrition* 84 (2): 274–88.

Mandaro, Laura. 2014. "Nation's First Soda Tax Is Passed." *USA Today*, November 5. http://www.usatoday.com/story/news/nation-now/2014/11/05/berkeley-passes-soda-tax/18521923/.

Marteau, Theresa M., Gareth J. Hollands, and Paul C. Fletcher. 2012. "Changing Human Behavior to Prevent Disease: The Importance of Targeting Automatic Processes." *Science* 337: 1492–95.

McKenzie, Richard B. 2009. *Predictably Rational? In Search of Defenses for Rational Behavior in Economics*. London: Springer.

Oatman, Maddie. 2012. "Soda: Ban It? Nah. Tax It? Yep." *Mother Jones*, June 18. http://www.motherjones.com/environment/2012/06/soda-sugar-tax-richmond.

O'Donoghue, Ted, and Matthew Rabin. 2003. "Studying Optimal Paternalism, Illustrated by a Model of Sin Taxes." *American Economic Review* 93 (2): 186–91.

Philipson, Tomas J., and Richard A. Posner. 2003. "The Long-Run Growth in Obesity as a Function of Technological Change." *Perspectives in Biology and Medicine* 46 (3): 87–107.

Public Health Law & Policy. 2011. "Local Taxes on Sugar-Sweetened Beverages in California: Legal Considerations and Procedural Requirements." Oakland, CA. http://changelabsolutions.org/sites/default/files/Local-Taxes-SSBs-CA_Legal_Memo-20130513.pdf.

Richburg-Hayes, Lashawn, Caitlin Anzelone, Nadine Dechausay, Saugato Datta, Alexandra Fiorillo, Louis Potok, and Matthew Darling, John Balz. 2014a. *Behavioral Economics and Social Policy: Designing Innovative Solutions for Programs Supported by the Administration for Children and Families.* Report 2014-16a. Washington, DC: Office of Planning, Research and Evaluation. http://www.acf.hhs.gov/sites/default/files/opre/bias_final_full_report_rev4_15_14.pdf.

———. 2014b. *Behavioral Economics and Social Policy: Designing Innovative Solutions for Programs Supported by the Administration for Children and Families, Technical Supplement: Commonly Applied Behavioral Interventions.* Report 2014-16b. Washington, DC: Office of Planning, Research and Evaluation http://www.acf.hhs.gov/sites/default/files/opre/bias_2014_report_technical_supplement.pdf.

Rizzo, Mario J., and Douglas G. Whitman. 2009. "The Knowledge Problem of New Paternalism." *Brigham Young University Law Review* 4: 905–68.

Ruhm, Christopher. 2010. "Understanding Overeating and Obesity." NBER Working Paper 16149, National Bureau of Economic Research, Cambridge, MA.

Schultz, P. Wesley, Jessica M. Nolan, Robert B. Cialdini, Noah J. Goldstein, and Vladas Griskevicius. 2007. "The Constructive, Destructive, and Reconstructive Power of Social Norms." *Psychological Science* 18 (5): 429–34.

Sharma, M. 2006. "School-Based Interventions for Childhood and Adolescent Obesity." *Obesity Reviews* 7 (3): 261–69.

Siler, Charles. 2014. "Berkeley Puts Sugar Tax on November Ballot; Could Be First City in Country to Take on Big Soda." *Berkeleyside*, July 2. http://www.berkeleyside.com/2014/07/02/berkeley-puts-sugar-tax-on-november-ballot-could-be-first-in-country-to-take-on-big-soda/.

Stern, Mark Joseph. 2013. "A Little Guilt, a Lot of Energy Savings." *Slate*, March 1. http://www.slate.com/articles/technology/the_efficient_planet/2013/03/opower_using_smiley_faces_and_peer_pressure_to_save_the_planet.html.

Thaler, Richard H., and Cass R. Sunstein. 2008. *Nudge: Improving Decisions about Health, Wealth, and Happiness.* New Haven, CT: Yale University Press.

Thompson, Derek. 2010. "Why Is American Food So Cheap?" *Atlantic*, January 11. http://www.theatlantic.com/business/archive/2010/01/why-is-american-food-so-cheap/33259/.

Thun, Michael J., Cathy A. Lally, John T. Flannery, Eugenia E. Calle, W. Dana Flanders, and Clark W. Heath Jr. 1997. "Cigarette Smoking and Changes in the Histopathology of Lung Cancer." *Journal of the National Cancer Institute* 89 (21): 1580–86.

Tomson, Bill. 2011. "Lawmakers Step into Food Fight over Pizza." *Wall Street Journal*, November 18. https://www.wsj.com/articles/SB10001424052970204517204577044533506200916.

Trumbo, Paula R., and Crystal R. Rivers. 2014. "Systematic Review of the Evidence for an Association between Sugar-Sweetened Beverage Consumption and Risk of Obesity." *Nutrition Reviews* 72 (9): 566–74.

Turner, Lindsey, and Frank J. Chaloupka. 2012. "Encouraging Trends in Student Access to Competitive Beverages in U.S. Public Elementary Schools, 2006–2007 to 2010–2011." *Archives of Pediatrics and Adolescent Medicine* 166 (7): 673–75.

Tversky, Amos, and Daniel Kahneman. 1981. "The Framing of Decisions and the Psychology of Choice." *Science* 211: 453–58.

Van Hook, Jennifer, and Claire E. Altman. 2012. "Competitive Food Sales in Schools and Childhood Obesity: A Longitudinal Study." *Sociology of Education* 85 (1) 23–39.

Vartanian, Lenny R., Marlene B. Schartz, and Kelly D. Brownell. 2007. "Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis." *American Journal of Public Health* 97 (4): 667–75.

Wallinga, David. 2010. "Agricultural Policy and Childhood Obesity: A Food Systems and Public Health Commentary." *Health Affairs* 29 (3): 405–10.

Wang, Y. Claire, Pamela Coxson, Yu-Ming Shen, Lee Goldman, and Kirsten Bibbins-Domingo. 2012. "A Penny-per-Ounce Tax on Sugar-Sweetened Beverages Would Cut Health and Cost Burdens of Diabetes." *Health Affairs* 31 (1): 199–207.

Wansink, Brian, and Pierre Chandon. 2006. "Can 'Low-Fat' Nutrition Labels Lead to Obesity?" *Journal of Marketing Research* 43 (4): 605–17.

Wansink, Brian, Andrew S. Hanks, and David R. Just. 2014. "From Coke to Coors: A Field Study of a Fat Tax and Its Unintended Consequences." Scholarly Paper, SSRN, Rochester, NY. http://papers.ssrn.com/abstract=2473623.

Wansink, Brian, and David Just. 2012. "How Bloomberg's Soft Drink Ban Will Backfire on NYC Public Health." *Atlantic*, June 14. http://www.theatlantic.com/health/archive/2012/06/how-bloombergs-soft-drink-ban-will-backfire-on-nyc-public-health/258501/.

Welsh, J. A., A. J. Sharma, L. Grellinger, and M. B. Vos. 2011. "Consumption of Added Sugars Is Decreasing in the United States." *American Journal of Clinical Nutrition* 94 (3): 726–34.

Wescott, R.F., B. M. Fitzpatrick, and E. Phillips. 2012. "Industry Self-Regulation to Improve Student Health: Quantifying Changes in Beverage Shipments to Schools." *American Journal of Public Health* 103 (10): 1928–35.

Wilcox, Keith, Beth Vallen, Lauren Block, Gavan J. Fitzsimmons. 2009. "Vicarious Goal Fulfillment: When the Mere Presence of a Healthy Option Leads to an Ironically Indulgent Decision." *Journal of Consumer Research* 36 (3): 380–93.

Williams, Peter. 2005. "Consumer Understanding and Use of Health Claims for Foods." *Nutrition Reviews* 63 (7): 256–64.

Wilson, Brent M., Stephanie Stolarz-Fantino, and Edmund Fantino. 2013. "Regulating the Way to Obesity: Unintended Consequences of Limiting Sugary Drink Sizes." *PLoS ONE* 8 (4): e61081. doi:10.1371/journal.pone.0061081.

Winstead, Lizz. 2011. "Is Pizza a Vegetable? Well, Congress Says So." *Guardian*, November 18. http://www.theguardian.com/commentisfree/cifamerica/2011/nov/18/pizza-vegetable-congress-says-so.

Zhao, Zhenxiang, and Robert Kaestner. 2010. "Effects of Urban Sprawl on Obesity." *Journal of Health Economics* 29 (6): 779–87.

Zhen, C., E. A. Finkelstein., J. M. Nonnemaker, S. A. Karns, and J. E. Todd. 2013. "Predicting the Effects of Sugar-Sweetened Beverage Taxes on Food and Beverage Demand in a Large Demand System." *American Journal of Agricultural Economics* 96 (4): 1070–83.