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Leanwashing:

A HIDDEN FACTOR IN THE OBESITY CRISIS

Aneel Karnani
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Medical research consensus is that a poor diet is a much greater determinant of obesity than lack of exercise. However, the authors' primary research shows that only about half of lay people believe that diet is the primary cause of obesity. People who mistakenly underestimate the importance of a poor diet are in fact more overweight than people who correctly believe that it is the primary cause of obesity. The marketing, public relations, and corporate social responsibility campaigns of food and beverage companies consistently overemphasize the lack of exercise as the cause of obesity—the authors call this “leanwashing.” (Keywords: Business and Society, Corporate Social Responsibility, Green Marketing)

Obesity is common, growing, serious, and costly. Until 1980, less than 10% of the population in industrialized countries was obese.¹ Today, these rates have doubled or tripled. Rates are projected to increase further and, in some countries, two out of three people will be obese within ten years. Obesity is associated with several chronic diseases, and an obese person incurs higher health expenditures than a person of normal weight. Obesity is a complex societal problem with no easy solution.

The starting point for any solution must be a diagnosis of the problem. We argue in this article that one of the likely causes of the obesity crisis is “leanwashing” by the major food and beverage companies. “Greenwashing” is a term derisively used to describe the public relations and marketing activities of a firm that deceptively promote the perception that the firm’s strategies and actions are environmentally friendly. In a parallel manner, we use the term leanwashing to describe the public

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relations and marketing activities of a firm that deceptively promote the perception that the firm is helping to solve the obesity problem and that deflect attention from the fact that it is directly contributing to the obesity crisis.²

Our argument consists of four tenets. First, considerable medical research shows that an unhealthy diet is a more significant cause of obesity than lack of exercise. Second, despite what the medical literature says, our primary research shows only about half of lay people believe that

bad diet is the primary cause of obesity. Third, these beliefs have consequences, as our empirical research demonstrates that people who mistakenly underestimate the importance of bad diet are in fact more overweight than people who correctly believe that bad diet is the primary cause of obesity. Fourth, the marketing, public relations, and corporate social responsibility (CSR) campaigns of food and beverage companies consistently overemphasize the role of exercise as the cause of obesity. This leanwashing is partly why so many people are misinformed about the primary role a high-calorie diet plays in weight gain and obesity, thus leading to their actually being overweight.

Obesity Crisis

Body mass index (BMI) is the most commonly used population-level measure of overweight and obesity, and is defined as a person's weight in kilograms divided by the square of his/her height in meters. The World Health Organization (WHO) categorizes a person as overweight if the BMI is between 25 and 30, and as obese if the BMI is greater than 30.

Common and Growing

In more than half of OECD (Organization for Economic Co-Operation and Development) countries the majority of the adult population is now overweight or obese (see Table 1). Obesity prevalence in the OECD countries has increased from 12.9% in 2000 to 17.8% in 2010, and is projected to get worse by 2020 (see Table 2). In contrast, obesity (but not necessarily overweight) appears to be less of a problem in some countries, with prevalence below 4% in Japan, Korea, and China, and around 10% in some European countries including Italy and Switzerland. However, these overall averages conceal some worrying truths. The prevalence of obesity is high even in these countries, in certain sections of society. For example, the proportion of overweight and obese Indian women in 2006 was 28.9% among urban women as compared to 8.6% among rural women.³

Even more troubling, possibly, is the growing prevalence of obesity among children. Empirical evidence suggests that obese children and adolescents often become obese adults,⁴ although it is challenging to track childhood obesity rates across the world because many countries do not collect such data. Disturbingly,

TABLE 1. Obesity: Common Crisis As a percentage of the adult population (aged 15 years and above), 2010 or latest available

	Overweight	Obese	Overweight and Obese
OECD countries	34.8	17.8	52.7
United States	33.3	35.9	69.2
United Kingdom	36.7	26.1	62.8
France	29.9	12.9	42.9
Germany	36.7	14.7	51.4
Brazil	33.1	15.0	48.1
Russian Federation	28.1	15.9	44.0
India	8.9	2.0	10.9
China	16.0	2.9	18.9

Source: OECD iLibrary, available at <www.oecd-ilibrary.org/sites/factbook-2013-en/12/02/03/index.html?contentType=&itemId=/content/chapter/factbook-2013-100-en&containerItemid=/content/serial/18147364&accessItemids=&mimeType=text/html>, accessed May 8, 2013.

TABLE 2. Obesity: Growing Crisis Obese as a percentage of the adult population (aged 15 years and above), years 2000 and 2010 (or latest available)

	2000	2010 (or latest available)
OECD countries	12.9	17.8
United States	30.5	35.9
Mexico	24.2	30.0
France	9.0	12.9
Italy	8.6	10.3
Switzerland	7.7	8.1
Japan	2.9	3.5
Brazil	11.1	15.0
China	2.9	2.9

Source: OECD iLibrary, available at <www.oecd-ilibrary.org/sites/factbook-2013-en/12/02/03/index.html?contentType=&itemId=/content/chapter/factbook-2013-100-en&containerItemid=/content/serial/18147364&accessItemids=&mimeType=text/html>, accessed May 8, 2013.

many countries have seen the problem escalate more rapidly in children than in adults.⁵ Over 20% of children aged 5-17 in the OECD countries are overweight or obese, and in the United States the rate is 35%.⁶ Among affluent urban populations in India, the combined prevalence of overweight and obesity has been reported to be as high as 40%.⁷ Globally, an estimated 43 million preschool children (under age 5) were overweight or obese in 2010, a 60% increase since 1990.⁸

Obesity is clearly a major and growing crisis in many countries, and it is arguably most severe in the United States. The Centers for Disease Control and Prevention has declared obesity a public health epidemic. There has been a dramatic increase in obesity in the United States: 36% of adults were obese in 2010, up from 30% ten years earlier; among children and adolescents, prevalence of obesity was 17% in 2010, about triple the rate from twenty years earlier.⁹

Serious and Costly

Obesity is clearly associated with increased morbidity and mortality. It is a major risk factor for hypertension, dyslipidemia, type-2 diabetes, coronary heart disease, stroke, gall bladder disease, osteoarthritis, sleep apnea and respiratory problems, and certain types of cancer.¹⁰ In the United States, 24 million people are afflicted by type-2 diabetes, with another 79 million people having pre-diabetes. Obesity outranks both smoking and drinking in its deleterious effects on both health and health costs.¹¹ A study published by the American Cancer Society notes that “poor diet is quantitatively an equivalent risk factor to tobacco.”¹² Higher body weights are also associated with increases in all-cause mortality. Severely obese people die 8-10 years sooner than those of normal weight, similar to smokers, with every 15 extra kilograms increasing the risk of early death by approximately 30%.¹³

Because obesity is associated with higher risk of chronic diseases, it is linked to significant health care costs. Roland Sturm showed that overweight and obese adults incur medical expenditures 36% higher than people of normal weight incur; by comparison, smokers incur 21% higher costs.¹⁴ The OECD estimates obesity to be responsible for 1 to 3 percent of total health expenditures in most countries, and 5 to 10 percent in the United States.¹⁵ Another study estimated that 9.1% of national medical spending in the U.S. is attributable to overweight and obesity.¹⁶ In 2011, the U.S. spent \$2.7 trillion on health care; thus the cost of obesity for the U.S. was in the range of \$135-270 billion. Further, there is a time lag between the onset of obesity and the related health problems, suggesting that the rise in obesity over the past two decades will lead to substantially higher health care costs in the future.

Aside from the economic cost, obese people often suffer from social stigmatization and discrimination, with the perception that an obese individual is personally culpable for his or her weight. This stigma is associated with depression, binge eating, a desire to avoid exercise, as well as other adverse psychological and physiological outcomes.¹⁷ Further, obesity is associated with poorer job prospects, contributing to an employment and wage gap. Obese people earn up to 18% less than people of normal weight. They need to take more days off, claim more disability benefits, and tend to be less productive on the job than people of normal weight. When production losses are added to health care costs, obesity accounts for over 1% of GDP in the United States, or over \$150 billion dollars.¹⁸

Despite the growing public discussion of obesity, it seems that many people who are obese or overweight do not recognize the problem. A Harris Interactive/HealthDay poll with 2,418 adults in 2010 in the United States found that 30% of overweight people think they are actually normal size, 70% of obese people feel they are merely overweight, and 39% of morbidly obese people think they are overweight but not obese.¹⁹ It seems overweight may be becoming the new normal, suggesting that the situation may get even worse as such perceptions may exacerbate the problem.²⁰ As overweight becomes more common, it is the person of normal weight who appears to be the one who does not fit in. Empirical research suggests that social contagion might be a factor contributing to the obesity epidemic.²¹

Causes of Obesity

While there are many correlates of obesity, they can be divided into three central potential causes: factors that affect caloric and nutrient intake; those that affect exercise levels or intensity; and genetic factors. While all three surely play some role and authors have argued for the importance of each, the *Journal of the American Medical Association* in a recent editorial²² concluded, “clearly, environmental causes of obesity are far more influential than genes...Obesity results from overnutrition and the primary therapeutic target is preventing or reversing overeating....Exercise is associated with weight loss but its duration or intensity has minor effects on weight loss relative to diet.²³” Overnutrition consists of eating too much and eating a diet rich in salt, sugar, and fat.²⁴ While genetic factors play some role in obesity, it is simply impossible for the human genome to have morphed over 20 years to fully explain the change in obesity rates.²⁵ Immigrants gain weight in proportion to the number of years they have been in the United States, supporting the role of environmental factors rather than genes.²⁶ Further, from 1980 to 2000 the number of people who self-report that they regularly exercise actually increased from 47% to 57%, and gym memberships in the U.S. nearly doubled from 1993 to 2009 (23M to 45M).²⁷ Empirical studies suggest that people are burning as many calories today as in the early 1980s.²⁸ The scientific evidence points to “overnutrition” rather than lack of exercise as the dominant cause of obesity.²⁹ Exercise has considerable health benefits and is an important factor in weight gain, but the primary driver of obesity is poor diet.

The conclusion that overnutrition is the primary cause of obesity is based on a whole host of scientific studies worldwide. Based on a study of Hadza hunter-gatherers in Tanzania, Pontzer et al. conclude that diet and energy intake, rather than decreased physical activity, are primarily responsible for obesity.³⁰ “This means to me that the big reason that Westerners are getting fat is because we eat too much—it’s not because we exercise too little,” said Dr. Pontzer.³¹ Researchers at the Early Bird Diabetes Study, based at the Peninsula Medical School in Plymouth, United Kingdom, have been conducting a cohort study for more than 11 years, and have concluded that “obesity leads to inactivity, rather than the other way around. Crucially important—calorie reduction, rather than physical activity, appears to be the key to weight reduction.”³²

Even if it were possible to substantially increase the duration or intensity of one’s exercise, for most people, it is probably too difficult to eliminate the amount of calories through exercise than through dieting. For example, “a chocolate chip cookie has the equivalent calories of twenty minutes of jogging, and working off a [McDonald’s] Big Mac would require four hours of biking.”³³ A Starbucks Venti Java Chip Frappuccino contains 580 calories, and it would take 4 hours to walk off this one drink.³⁴ Since the 1970s, calorie intake in the U.S. has increased by 200 to 600 calories per person per day (600 extra calories per day would result in a 50 pounds weight gain over a year), which would explain the obesity trend in the last few decades.³⁵ Even the American College of Sports Medicine, jointly with the American Heart Association, in its 2007 physical activity guidelines writes, “it is reasonable to assume persons with relatively high daily energy expenditures would be less likely to gain weight over time, compared with those who have low energy expenditures. So far, data to support this hypothesis are *not*

particularly compelling” [emphasis added].³⁶ The report goes on to conclude that physical activity “appears to produce only modest increments of weight loss beyond those achieved by dietary measures.”

Exercise, of course, does result in improved health and fitness, and greater longevity.³⁷ Exercise also does something that dietary restrictions cannot: it builds muscle. “Diet is about pounds, exercise is about inches. Diet is about weight, exercise is about health,” writes Doctor Lustig.³⁸ The Mayo Clinic reports that exercise benefits in that it helps develop and maintain positive mental health, improves energy, sleep patterns, and organ health.³⁹ The bottom line is that regular exercise is beneficial in many ways, and to some degree in helping weight loss and maintenance, just not to the same extent as diet.

Lay Theories

Regardless of what “science says,” researchers have only recently begun asking laypeople what they believe causes obesity. Lay theories are “implicit assumptions that ordinary people hold about themselves and their world.”⁴⁰ People hold lay theories (or naïve “common sense” beliefs) about many phenomena that occur in their environments, and these lay theories may often differ from scientific or empirical facts. For example, some laypeople believe that larger objects fall more quickly, or that higher priced products always have higher quality. Research has shown that people may acquire such lay theories from a variety of sources, including their cultural environments,⁴¹ everyday experiences,⁴² and folk wisdom.⁴³ Insofar as popular media and corporate communications contribute to these sources, the public discourse on a given topic may well play a large role in influencing people’s lay theories on that matter.

Public discourse on the causes of obesity, in contrast to the emerging consensus in the medical community, is markedly mixed. As an example, here are some outright contradictory views about obesity from popular media headlines:

“Exercise holds key to keeping weight off.”⁴⁴

“An hour of daily exercise ‘needed to stay slim.’”⁴⁵

“Why exercise won’t make you thin.”⁴⁶

“Diet not exercise, plays role in weight loss.”⁴⁷

“Fat gene found by scientists.”⁴⁸

“Scientists debunk so-called fat gene.”⁴⁹

Evidently, different viewpoints have enjoyed significant amounts of airtime and weightage in the media. However, given the amount of public discussion about obesity, it is likely that most people, including those of normal weight, have arrived at some beliefs about the causes of obesity itself. Our recent work has coined these beliefs “lay theories of obesity,” and has examined their correlates.

We conducted six separate surveys in four different countries to determine the relative importance of overnutrition versus lack of exercise as the causes of obesity in lay theories.⁵⁰ The research methodology and results are reported in

greater detail in a paper published in *Psychological Science*; in this article, we provide an overview of the main results. In the first study, we asked 254 South Koreans drawn from a nationally representative sample to indicate what they believed to be the *primary* cause of obesity: eating too much, not exercising enough, or genetics. Diet theorists—that is, people who believe poor diet is the primary cause of obesity—accounted for 50% of the respondents, exercise theorists for 41%, and gene theorists for 8%. In the second study, we asked the same question of 100 U.S. residents using Amazon Mechanical Turk.⁵¹ The results were: 44% were diet theorists, 48% were exercise theorists, and 8% were gene theorists. The third study included 290 respondents from a nationally representative online panel in France. Instead of asking them directly what is the primary cause, we had them divide up 100 points, such that a greater number of points represented greater perceived culpability. On average, people allocated 44% to diet, 31% to exercise, and 24% to genetics. We replicated this in another study of 84 U.S. residents and found virtually the same averages (diet- 46%, exercise- 33%, genetics- 21%).

To ensure that individuals were not indicting diet or exercise simply because those were the choices provided to them by the researchers, the next two studies were different with the survey question being open-ended. A research assistant, who did not know our hypothesis, approached 548 people at various public places in Hong Kong. The research assistant asked respondents what they perceived to be the main cause of obesity, and recorded whether the first response implicated poor diet, lack of exercise, or something else. Diet theorists accounted for 66% of respondents, followed by exercise theorists at 23%, and gene/other theorists at 11%.

In the sixth study, we asked 251 Amazon Mechanical Turk respondents in the U.S. the open-ended question, “In general, what do you think is the primary factor responsible for people being overweight? (in at most one sentence).” Two assistants blind to our hypothesis coded each response. The results were: diet alone was invoked by 49% of respondents, lack of exercise alone by 15%, a combination of diet and exercise by 20%, and other causes (including genetics) by 15%.

Empirical results from the above six studies (summarized in Table 3) suggest that only about half the population are diet theorists. While not a scientific study

TABLE 3. Summary of Surveys on Lay Theories

Study Number	Country	Sample Size	Results: Type of Theorists, in percent			
			Diet	Exercise	Hybrid: Diet + Exercise	Gene/Other
1	S. Korea	254	50%	41%		8%
2	U.S.	100	44	48		8
3	France	290	44	31		24
4	U.S.	84	44	36		21
5	Hong Kong	548	66	23		11
6	U.S.	251	49	15	20	15

Source: Brent McFerran and Anirban Mukhopadhyay, “Lay Theories of Obesity Predict Actual Body Mass,” *Psychological Science*, 24/8 (August 2013): 1428-1436.

per se, a poll conducted by Harris Interactive in the United States in 2004 among 2,275 adults found similarly that many people incorrectly blame exercise for obesity.⁵² The survey question was “Which of these do you think are the major reasons why obesity has increased?” A huge majority of 83% chose lack of exercise, while only 34% chose excessive calorie consumption.

Medical research has established overnutrition as the dominant cause of obesity. Still, about half the population believes poor diet is not the primary cause. “Data suggests that many people are either in denial, or they are woefully ignorant, and that most people just eat too much,” said Humphrey Taylor, chairman of The Harris Poll at Harris Interactive.

Lay Theories Matter

This “gap” between perception and reality in lay theories is consequential, because previous research has consistently shown that lay theories exert profound and enduring influences on judgment and behavior.⁵³ For example, one study tracked students as they progressed through college, and found that lay theories about the causes of failure (intelligence or effort) strongly predicted the students’ reactions of helplessness, drops in self-esteem, and grades.⁵⁴ Marketing researchers and consumer psychologists have recently begun to investigate how lay theories regarding psychological constructs may influence eating behaviors.⁵⁵ For example, researchers have shown that lay theories regarding the amount of self-control that people have, and whether it can be increased or not, can influence health-related behaviors, such as for New Year’s resolutions⁵⁶ and parents’ fast food and snack choices for their children.⁵⁷ Correspondingly, one’s lay beliefs about the transience of one’s current emotional state can influence the choice of indulgent versus healthy food.⁵⁸ By this logic, lay theories about the causes of obesity should also predict outcomes related to obesity, in other words, peoples’ food and exercise choices should be influenced by their lay theories about the causes of obesity.⁵⁹ Diet theorists should make better choices about what and how much they eat, thus resulting in being less overweight (or obese) than people who are not diet theorists. Indeed, we find empirical support for this exact hypothesis: diet theorists did indeed tend to have lower BMI than people who were not diet theorists.

In our empirical studies described above, people’s lay theories about the causes of obesity were significantly correlated with their actual BMI even after controlling for numerous additional variables. That is, a person’s beliefs about the cause of obesity could be successfully used to predict whether he or she was likely to be overweight. In the French sample described above, the more points participants allocated to diet, the thinner they actually were, even after controlling for virtually all known correlates of body mass—such as socio-economic status, medical conditions, whether they smoked or not, and how much they slept. The size of the effect was substantial—someone who allocated all 100 points to diet, representing the extreme belief that diet is the only relevant factor, and exercise and genetics do not matter at all, was liable to have a BMI approximately three points lower than someone who allocated zero points to diet (predicted BMIs were 26 versus 23). For a person 171 cm in height, which is the national average in France, this corresponds to a weight

differential of 19 pounds. In the Korean sample, the average BMI for “diet theorists” was 21.55 while that for “exercise theorists” was 23.10—both within the normal range, but still representing a difference of nearly ten pounds for an individual 160 cm in height (i.e., the average Korean). The same pattern was found when we used people’s beliefs about the primary cause (the Korean study), or asked them for an open-ended response to state their beliefs about the causes (the American sample). Diet theorists were the least overweight, while exercise theorists were the most overweight in all our studies. Belief in genes as the primary cause had no relationship with observed body mass in any of our studies.

Our empirical results strongly support the hypothesis that diet theorists are less overweight or obese than people who are not diet theorists. At least one polling agency has also reported very similar results to what we found. In 2010, Harris Interactive/HealthDay conducted a poll with 2,418 U.S.-based adults. According to their findings, “Most respondents who felt they were heavier than they should be blamed lack of exercise as the main cause, with 52% of overweight people, 75% of obese people and 75% of morbidly obese people saying they didn’t exercise enough. Food consumption was seen as the lesser of two culprits, with 36% of overweight respondents, 48% of obese respondents and 27% of morbidly obese feeling that they ate more than they should in general.”⁶⁰ This implies that overweight or obese people are more likely to be exercise theorists than diet theorists, which is consistent with our hypothesis and findings.

While we controlled for many factors, the above empirical results linking lay theories to BMI rely on cross-sectional data, and reverse causation is always a potential concern with such data. However, much past research has shown that lay theories are an antecedent to actual behavior,⁶¹ even in the domains of food and exercise. While our data prevent us from making a strong causal claim, the causal direction we propose has much more support in the literature than the reverse, and we conducted several other studies to support this notion and rule out, for instance, alternatives such as the possibility that overweight people may adopt an exercise theory to reduce cognitive dissonance.⁶²

Government Intervention

The debate on public health issues is often framed on a continuum from “individualizing” to “systemic” extremes.⁶³ Individualizing frames largely limit the causes of the problem to particular individuals, and emphasize personal freedom, choice, and responsibility. Systemic frames broaden the focus, assigning responsibility to government, business, and larger social forces. These frames have implications for the favored solutions: defining a problem in individualized terms suggests the solution involves minimal or no governmental responsibility, while systemic frames mean government intervention is favored. Business has usually framed public health issues in individualized terms, whereas public health experts and social activists have usually adopted systemic frames. As an example, the tobacco industry emphasized personal choice and responsibility, whereas its opponents in the debate emphasized that smoking was powerfully addictive, the involuntary nature of secondhand smoke, and that children needed to be protected.

If and when the public debate tilts towards the systemic end, business has usually argued for voluntary CSR initiatives and self-regulation rather than government intervention. General Mills, a large food company, goes one step further and argues that “a determination that there is a need for governmental intervention would also necessarily hinge on a conclusion that the food industry is not, on its own, moving enough with its own self-regulatory efforts.”⁶⁴ The opponents in this debate have often seen these tactics as a charade, as attempting to delay or stifle effective government action. As scientific evidence and public concern about the linkage between smoking and lung cancer grew, in 1954 the tobacco industry published in 448 newspapers a statement assuring that “we accept an interest in people’s health as a basic responsibility, paramount to every other consideration in our business.”⁶⁵ This is not to say that CSR and self-regulation are always a charade; it is just that the opponents in the public debate have often been skeptical about the effectiveness of these tactics.

In response to public concerns about obesity, the food industry has argued in terms of personal choice and responsibility, whereas the opposite argument frames the causes of obesity in more systemic terms. Public health experts have drawn parallels between how the tobacco industry responded to health concerns due to smoking, and how the food industry is responding to concerns about obesity. In an influential article, Brownell and Warner conclude that there “are significant similarities in the actions that these industries have taken in response to concerns that their products cause harm.”⁶⁶ Even business publications, such as *Fortune* and *Forbes*, have noted similar parallels between these industries.⁶⁷

However, even strident critics of the food industry do not call for a ban on high-calorie foods. Instead, they advocate a tax on such foods (similar to a “sin” tax on tobacco and alcohol). In 2013, Mexico passed a law imposing a one peso (about 8 cents) per liter tax on sugary beverages and an 8% tax on junk food. The junk-food tax applies to high-calorie foods that pack 275 or more calories into 100 grams of food—these include chips, candies, pudding, peanut and hazelnut butters, sugary cereals, and ice cream.⁶⁸ There is a growing trend in Europe to impose sin taxes on food and drinks associated with poor health and obesity. France, Hungary, Finland, Norway, and Denmark have levied such taxes in recent years.⁶⁹ The OECD too has advocated for taxes on unhealthy foods. The British Prime Minister David Cameron said he would consider a “fat tax” on some foods, adding that the American obesity rate “should be a wake-up call” for his country.⁷⁰ In the U.S., several states and local governments (such as Vermont, Texas, New York City, and Philadelphia) have proposed such a tax, but have not succeeded, which is not surprising given the tilt towards the individual side of the scale in American politics and discourse.

In a more popular intervention than taxes, many countries have chosen to restrict food marketing to children.⁷¹ Norway, Quebec (Canada), and Sweden have banned all advertisements during children’s television programming. Over 30 countries have national laws that set some limits on television advertising to children (for all products, not just food). Some countries limit advertisements that promote unhealthy diets to children. The UK has established nutritional standards for what may be advertised to children. Going a step further, in Nigeria and Thailand,

all ads for food must be approved by a national governmental body. In France, since 2007, processed food advertisements have had to include a statutory warning consisting of four parts, or else pay a surcharge in lieu of the warning.⁷²

Without taking sides in this existing debate between personal responsibility and systemic causes of obesity, we offer a novel argument that places some blame on the food industry for perpetuating the obesity epidemic, and calls for government intervention to increase public education about the true causes of obesity. Even if we grant for the sake of the argument that individuals may largely be responsible for making choices about food consumption and maintaining a healthy weight, the individuals making these choices are guided by their lay theories about the causes of obesity. As our research has demonstrated, about half the population is misinformed about bad diet being the dominant cause of obesity, which directly impacts their likelihood of being overweight or obese. Put simply, our central thesis in this article is that by systematically deflecting the public discourse from bad diet to exercise and other factors, the food industry is at least partly responsible for the misinformed lay theories of obesity and is thus culpable in perpetuating the obesity epidemic. We call this “leanwashing.”

Leanwashing

As discussed above, people’s lay theories may stem from many sources, but the public discourse on a given matter can play a very large part. In today’s environment, corporate messaging is one of the most prominent sources of messages regarding the probable causes of obesity. Virtually every food company in its CSR statement proclaims its commitment to be a “part of the solution” to the obesity problem.⁷³ It is thus reasonable to investigate whether the corporate messaging is consistent with this commitment, and whether the content of the messages is consistent with the science on obesity. Our research indicates that the food industry’s messaging on this topic is far from unbiased, and is inconsistent with the scientific evidence. The vast majority of corporate messages involve exercise, and the favored framing usually features “choices” or “balance.” Poor diet is barely mentioned, if at all. As Michael Mudd, a former executive vice president for Kraft Foods, writes, “the industry will always try to camouflage itself as just one of many causes in the growth of obesity.”⁷⁴

We focus on three businesses here: packaged food (companies such as Kraft, General Foods, General Mills, Kellogg’s, Unilever, Nestle, Danone), beverages (companies such as Coca-Cola, PepsiCo), and fast food (companies such as McDonald’s, Burger King, Yum! Brands).⁷⁵ Upstream producers including agri-business firms (such as Cargill, Monsanto, and Archer Daniels Midland) and the farming industry are also probably complicit in the obesity crisis, but seem to be less involved in leanwashing, likely because they are less consumer-facing businesses. At the very least, they have a financial interest in the public being somewhat misinformed about the role of diet (versus exercise) in weight gain. We will refer to the above three businesses collectively as the food industry and food companies. The food industry (unlike the tobacco industry) is very diverse and fragmented, ranging from the local pastry shop to McDonald’s. However, it is dominated by large multinationals, many of them based in the U.S., not so much in terms of revenues, but more in terms of

global reach, visibility, corporate messaging, and ability to shape the public discourse and public policy. We, therefore, focus our research in this section on these large multinational food companies.

The obesity crisis is attracting too much public attention for the food companies to ignore it. All major food companies have launched marketing, public relations, and CSR campaigns claiming to be part of the solution to the obesity crisis. At the same time, the food companies have a fiduciary responsibility to their shareholders to target growth and increase profits. This creates a dilemma for the food companies, and the profit motive usually wins out over CSR. Upon becoming the CEO of PepsiCo in 2006, Indra Nooyi cultivated a corporate image tuned to health and global social responsibility, and launched a push into healthier products. *The Wall Street Journal* reported in 2011 that Nooyi was “facing doubts from investors and industry insiders concerned that her push into healthier brands have distracted the company from some core products.”⁷⁶ For example, Diet Coke took the number two brand spot from Pepsi-Cola in the United States. In response, PepsiCo reassured investors that marketing would be boosted for key snack brands including Lays, Doritos, Cheetos, and Tostitos, and for soft drinks with a renewed focus on cola.⁷⁷

The fact that the product portfolios of food companies tend to be dominated by processed foods has attracted much attention, but that is not the focus of this article. Many commentators have called attention to the healthfulness of these foods, and raised concerns about their effects on public health. Our thesis is instead to highlight a possible *indirect* effect of food marketing on obesity—not through the healthfulness or otherwise of the products that are marketed, but instead by the substantial promotional and PR messages that are released.

Since diet theorists are likely to have lower BMIs, a possible part of the solution to the obesity crisis is to have more people become diet theorists. Bringing people’s beliefs in line with the current scientific consensus should induce them to reduce their calorie intake and thereby lose weight. As a direct consequence, diet theorists would be likely to consume less of the products sold by the food companies (because they would consume fewer calories in all, i.e., a quantitative change in food intake, and also possibly fewer processed foods, a qualitative change in the nature of foods eaten). Hence, it is very likely that this would reduce their profitability. *Ceteris paribus*, given no change in product portfolio, the food companies therefore have a vested interest in discouraging their customers from becoming diet theorists and actually encouraging them to become exercise theorists instead. It is therefore not surprising that an analysis of the communication and promotional activities of the food companies, of messages not aimed at directly advertising any specific product, reveals a multi-pronged effort to deflect attention from bad diet to exercise (and other factors) as the causes of obesity. This effort, overlaid like much greenwashing with the theme of social responsibility, is what we call leanwashing.

In what follows, we report the results of several searches we made, where we investigated prominent corporate messages (defined broadly) dealing with diet, exercise, and obesity in general. We searched for this information in three ways. First, we selected the top ten processed food manufacturers in the world⁷⁸ and did separate Google searches for each company, using combinations of the keywords “obesity,” “social responsibility,” “physical activities,” “exercise,” and the company’s name,

including all hits first, and focusing on non-U.S. based reports in a second iteration. Second, many companies—e.g., Coca-Cola and PepsiCo—have relevant pages on their websites, with updates on their CSR activities including those involving obesity—and we searched for these pages specifically. Finally, we searched for press releases related to how food companies respond to obesity-related questions. Based on our findings, we identify four media where leanwashing is most evident—public statements, lobbying, philanthropy, and sponsorships of sports teams and events.

Public Statements

Public statements by companies and their top executives often argue that lack of exercise or sedentary lifestyle is the primary cause of obesity. Blaming lack of exercise is a plausible argument and has a receptive audience. Moreover it gives the food industry a robust and ethically unchallengeable platform of emphasizing fitness. To illustrate this approach, here is an excerpt from a CNN interview with Indra Nooyi, the chairman and CEO of PepsiCo:⁷⁹

Interviewer: [Foreigners] see Americans and say they are obese. They say it is because of the snacks and fast food and high calorie drinks.

Indra Nooyi: I wish the solution was that simple. I can turn it around and say, I'll give you an example. When I was a kid, I would come home from school, throw my bag, go out to play. My daughter comes home from school, throws her bag, goes to play, but sitting in front of the computer because her definition of play has changed. They don't go out to play. Lifestyles have changed.

In an interview with *Fortune* magazine, Indra Nooyi went further and claimed "If all consumers exercised, did what they had to do, the problem of obesity wouldn't exist."⁸⁰ Of course, while Ms. Nooyi is not a medical professional, her (incorrect) advice still forms part of the narrative that consumers use in developing their personal lay theories of obesity. The food companies nurture the erroneous lay theories and thus contribute to the obesity crisis.

In a similar vein, when asked about the obesity concern, Muhtar Kent, CEO of Coca-Cola, replied, "This is an important complicated societal issue that we all have to work together to provide a solution. That's why we are working with government, business and civil society to have active lifestyle programs in every country we operate by 2015."⁸¹

Although food companies do try to portray lack of exercise as the primary cause of obesity, this is a tough argument to defend in light of the medical evidence. A more common strategy adopted by the food companies is to argue that both exercise and diet are the causes of obesity. A popular phrase used in this approach is "energy balance"—the balance between the calories you take in and the calories you burn.⁸² Virtually every food company and food industry trade association uses this approach, including Coca-Cola,⁸³ PepsiCo,⁸⁴ and McDonald's.⁸⁵ As Dr. Freehoff writes, "Coca-Cola calls it an '*active balanced lifestyle*,' McDonald's a '*balanced active lifestyle*,' General Mills a '*balanced and healthy lifestyle*,' Unilever a '*balanced diet and lifestyle*,' Mars a '*well-balanced lifestyle*,' while Nestle and PepsiCo refer to it as '*a balanced lifestyle*.'"⁸⁶ A recent example of how this strategy plays out in marketing communications is from Coca-Cola's 2013 "Coming Together" campaign. One ad,

entitled “The calorie dictionary” shows people engaging in routine activities, such as dancing (for 10 minutes) and laughing (for 75 seconds), that would burn off the calories in a can of Coke. What the ad fails to note is that all of the activities need to be done *in combination*. The UK variant of the ad was banned by the Advertising Standards Authority for being deceptive, as viewers complained that the ad was misleading consumers into thinking that burning off a can of Coke was as simple as engaging in any one of the listed activities.⁸⁷

Corporate statements by senior managers echo the message of deflecting discourse away from diet-based explanations for obesity. Patrick Cescau, then CEO of Unilever, argued in a keynote speech to the Confederation of the Food and Drink Industries of the European Union, that obesity remained a multi-faceted problem that had as much to do with the lives people lead as the food they eat. “Many of us [food companies] use sponsorship programmes to promote physical activity and sport. Food companies are well placed to do this...The big difference between now and 60 years ago is that they [British people] are expending far fewer calories. Let us never forget this. Here are two sides to the obesity equation: diet and physical activity.”⁸⁸ Nestle advises parents that “encouraging regular physical activity and healthy eating habits will help your child achieve and maintain a healthy body weight.”⁸⁹ John Sutherland, the chairman of Cadbury Schweppes, blamed the obesity crisis on consumers, “We cannot escape the role of personal responsibility we each have.” He continued that the growth in the number of overweight people was “mirrored by a decline in physical activity and the growth in out-of-home food consumption.”⁹⁰

Another variant of this approach used by the food industry is to argue that the obesity problem is too complex to be reduced to a single solution. The American Beverage Association states on its website “Many factors cause obesity... obesity involves three main factors: genetics, diet and exercise...obesity is a serious and complex problem best addressed by living a balanced lifestyle—consuming a variety of foods and beverages in moderation and getting plenty of exercise.”⁹¹

Lobbying

The food industry spent \$175 million on lobbying activities in the U.S. during the three years 2009-2012, and it has achieved its goals. In their “Special report: How Washington went soft on childhood obesity,” Wilson and Roberts conclude that the food industry has “never lost a significant political battle in the United States despite mounting scientific evidence of the role of unhealthy food and children’s marketing in obesity.”⁹² The food industry uses lobbying “front groups” with consumer-oriented names that would not show their industry connections, such as Center for Consumer Freedom (CCF) and Americans Against Food Taxes (AAFT). The CCF and AAFT are arguably modeled after tactics used by big tobacco, such as their Get Government Off Our Back “coalition.” Such front groups are effective and powerful lobbies to prevent government regulation.⁹³

There are numerous examples of food industry lobbying that distort the truth about what underlies the obesity epidemic. The CCF is a nonprofit organization that is allegedly a “lobbying front for the restaurant, food, beverage, and alcohol industries.”⁹⁴ CCF does not disclose its donors, but acknowledges that it is supported by restaurants and food companies.⁹⁵ The CCF website states, “A hefty number of studies

has shown that the trend of rising obesity rates can be attributed not to increased intake of food in general (or any particular food) or to the influence of restaurants, but rather to less physical activity compounded by a variety of other factors that are constantly being explored." In direct contradiction to the evidence cited in this article and elsewhere in the literature, the CCF maintains that it is a myth that "65 percent of Americans are overweight or obese," and that it is myth that "overeating is the primary cause of obesity."⁹⁶ Similarly, the AAFT, while self-describing on its Facebook page as "a coalition of concerned citizens—responsible individuals, financially strapped families, small and large businesses in communities across the country—opposed to the government tax hikes on food and beverages,"⁹⁷ is really a front for the food industry.⁹⁸ Of its membership, almost all are associated with the food industry through production, distribution, or promotion: 58% as sellers and 18% as suppliers. Much of the remaining members are community organizations, 93% of whom are associated with the food and beverage industry, 83% of these are sponsored by one company, Coca-Cola.

There is much evidence of the power of the food industry lobby. Public health officials announced in 2011 the first menu overhaul in 15 years of the government's \$10.5 billion school lunch program. "Then Congress got involved—at the behest of potato and pizza companies—to preserve French fries as a menu staple and to declare pizza, with its tomato sauce, to be a vegetable."⁹⁹ Following the decision, a Pizza Hut in San Antonio, Texas, proclaimed "Now serving vegetables!" on its outdoor sign.¹⁰⁰ Industry influence happens at a more local level as well. "In March 2011, the Children's Hospital of Pennsylvania received a \$10 million pledge from a non-profit organization created by the American Beverage Association, the Foundation for a Healthy America. Just months later, in June 2011, the Philadelphia Mayor Michael Nutter's soda tax proposal was defeated for a second time."¹⁰¹

In 2009, Congress asked four government agencies—the FTC, the CDC, the Department of Agriculture, and the FDA, collectively referred to as Inter-Agency Working Group (IWG)—to draft voluntary nutrition standards for children's food marketing. The draft guidelines were published in April 2011 and were praised by health groups, but criticized by the food industry for the sugar, salt, and fat suggestions being too low. The pockets available for lobbying are both deep and quick to act when profits are threatened. American Beverage Association lobbying has averaged around \$1 million (range: \$0.4 million to \$1.1 million) annually from 2003-2013 with two exceptions: 2009 (\$18.9 million) and 2010 (\$9.9 million),¹⁰² likely not coincidentally the two years when taxes on sugar were being proposed and the IWG was developing standards for advertising foods to children. Congress killed the inter-agency effort in December 2011, in spite of the fact that the guidelines were meant to be voluntary. What did the guidelines contain? A recommendation stating that food and beverages advertised to children must provide "a meaningful contribution to a healthful diet." One large marketer, General Mills, wrote in a public comment that the IWG guidelines were unlikely to be helpful because of their "focus on food advertising is misplaced, and distracts badly needed attention from the declines in physical activity and other societal factors that *actually* are fostering the obesity crisis" [emphasis in the original].¹⁰³ It is instructive to note, again, the emphasis on "physical activity and other factors." General Mills asserted that 88 of

the 100 most common foods eaten by Americans would fail the new guidelines, and that if Americans followed them their food expenses would rise by \$1632 annually per person. Of course, the cost of being obese is much higher, estimated at \$8365 for women and \$6518 for men.¹⁰⁴ In sum, industry sponsorship and organization support tends to happen below a threshold for reasonable deniability, and the extent to which the food industry can impact policy is considerable.

Shortly after her husband's first presidential victory, in February 2010 First Lady Michelle Obama launched a campaign called "Let's Move" to address childhood obesity. In a speech in March 2010, she told the Grocery Manufacturers Association, "We need you not just to tweak around the edges but to entirely rethink the products that you are offering, the information that you provide about these products and how you market those products to our children." Allegedly due to food industry (including agribusiness and farming states) lobbying efforts, in less than two years the campaign pivoted from criticizing the food industry to promoting exercise—a favored cause of the food industry.¹⁰⁵ In November 2011, speaking at a summit organized by the Partnership for a Healthier America, Mrs. Obama heaped praise on the food companies, and then continued, "I want to talk about the crisis of inactivity that we see among our kids." The campaign has been frequently criticized by conservatives who believe its goals are at odds with personal liberty. However, health advocates have expressed disappointment too, saying "Let's Move" has softened its tone to placate food and drink interests in an election year.¹⁰⁶ Senator Tom Harkin (Democrat-Iowa) agreed with this view and told Reuters that the White House "went wobbly in the knees." The Physicians Committee for Responsible Medicine (PCRM), a health advocacy group, charged that the First Lady is taking the "noncontroversial" route by focusing on exercise instead of nutrition. "Obesity is fueled by the hot dogs, burgers, and junk food that are being fed to children in school and at home," said PCRM nutrition education director Susan Levin. Recommendations about fitness "will not combat skyrocketing rates of childhood obesity, diabetes, and high cholesterol."

Kelly Brownell, Dean of the Sanford School of Public Policy at Duke University and former director of the Rudd Center for Food Policy and Obesity at Yale, insists the obesity crisis won't be solved without forcing food companies to do the things they don't want to do. "I expect history will look back with dismay on the celebration of baby steps [the food] industry takes (such as public-private partnerships with health organizations, 'healthy eating' campaigns, and corporate social responsibility initiatives) while it fights viciously against meaningful change (such as limits on marketing, taxes on products such as sugared beverages, and regulation of nutritional labeling)."¹⁰⁷

Exercise Philanthropy

Many food companies engage in what seem like philanthropic donations to encourage people, especially children, to exercise more. It is an effective way to position the firms as part of the solution to the obesity crisis and at the same time to deflect criticism. Michele Simon, a public health attorney, writes, "The ways that industry funds physical activity generally fall into the following categories: (1) web-based education, sponsored by one or more companies; (2) in-school

programs; (3) joint programs with public entities (universities or government); (4) donations to non-profits and/or communities. The purpose is almost always the same: to gain positive PR while deflecting criticism."¹⁰⁸

PepsiCo teamed with KaBoom in 2005 and 2006 to help build 12 playgrounds in U.S. cities, branded with the company's Smart Choices logo.¹⁰⁹ Coca-Cola has helped build and renovate neighborhood parks, playgrounds, and fitness centers. For example, Coca-Cola has partnered with ParticipACTION, a Canadian non-profit organization dedicated to support healthy and active living.¹¹⁰ The CEO of Coca-Cola was joined by the Governor of Georgia and the Mayor of Atlanta at the announcement of a pledge for \$4 million to support physical activity programs in Atlanta and the state of Georgia. In May 2013, Coca-Cola launched an initiative to inspire America to "Get the Ball Rolling" by hosting events and programs that celebrate the joy of activity. "We are committed to being a part of the solution to obesity, and we can't wait to "Get the Ball Rolling" this summer."¹¹¹ Kellogg's launched in 2005 its Get in Step initiative encouraging consumers to walk an extra 2,000 steps a day as well to consume a bowl of any of the company's cereal products. The program used the company's mascot Tony the Tiger as a means to target children.¹¹² Food companies are also active in sponsoring conferences to focus greater attention on exercise. For example, the 3rd International Congress on Physical Activity and Public Health in 2010 was sponsored by Coca-Cola, Kellogg's, and Nestle.

Such activities are not restricted to North America. For example, in 2011, the Kraft Foods Foundation invested more than US\$7 million to launch healthy living classes in Italy, France, Germany, and Spain, targeting elementary schools, sports facilities, parks, and community centers. The funding was aimed at improving sports facilities, playgrounds, gyms, and recreational centers. In-class activities included exercise, workshops on nutrition and healthy eating, sports activities, and games.¹¹³ Similarly, Coca-Cola has funded sports and physical activity programs in China,¹¹⁴ Brazil,¹¹⁵ Singapore,¹¹⁶ and the Netherlands, among many others,¹¹⁷ as have Nestle¹¹⁸ and PepsiCo in Europe,¹¹⁹ among other places. According to the Confederation of the Food and Drink Industries of the European Union, "the promotion of healthy lifestyles is a priority of the food and drink industry and this is reflected in corporate policies." For example, Unilever sponsored the "Flora London Marathon and the Flora Women's 5 km challenge. In Denmark it sponsored the Danish Handball Summer School for kids."¹²⁰

Exercise is undeniably good for health, but *The Wall Street Journal* points out the loophole in the proposition: "if a 50-pound kid plays soccer for 45 minutes, she burns up about 120 calories. But a typical post-game snack chosen from Pepsi's "good for you" brand list—a 15.2-ounce bottle of Dole Strawberry-Kiwi juice and a reduced calorie Quaker granola bar—adds up to 320 calories."¹²¹ Michael Mudd (former executive vice president of Kraft Foods) writes, "Next time you hear of a big food or beverage company sponsoring an after-school physical activity program in your community, you can be sure they'll say it's to show 'our company's concern for our kids' health.' However, the real intent is to look angelic while making consumers feel good about the brand and drawing attention away from the unhealthful nature of the company's products. 'Posing for holy cards,' as one of my colleagues used to put it."¹²²

Sports Sponsorships

Food and beverage companies spend on associating themselves with sports in two major ways: by endorsing high profile athletes, and by sponsoring athletic leagues and events. To the former, companies spend millions to professional athletes to endorse their products. For example, Kobe Bryant earned more than \$12 million in 2010 for endorsing McDonald's restaurants. These athlete endorsements tend to be for products that are unhealthy, filled with fat and/or sugar. One study examined the 100 most prominent athletes (ranked by *Bloomberg BusinessWeek*) and their endorsements.¹²³ These 100 athletes collectively endorsed 122 food and beverage products, of which 79% were energy-dense and nutrient-poor. For example, 93.4% of the advertised beverages had 100% of their calories from added sugar. The notion that food and beverage companies place sports figures on disproportionately unhealthy products was also supported in another study.¹²⁴ More disturbingly, these sports references and endorsements were primarily used in products targeted to children and adolescents, and children see more commercials for such products than other demographic segments. In fact, food products make up a full one-third of all commercials in children's TV programs.¹²⁵

Companies also invest in sponsoring numerous athletic events, including the Olympics. Immediately prior to the 2012 Olympics, a London cardiologist stoked a long-simmering controversy with an opinion piece on the BBC website.¹²⁶ Mincing no words, he wrote, "In the context of an obesity epidemic I find it obscene that the Olympics chooses to associate itself with fast food [McDonald's], sugary drinks [Coca-Cola], chocolate [Cadbury's] and alcohol [Heineken]." Further, anticipating the responses, he followed a few sentences later with, "it is naive and ignorant of sports men and women to blame obesity on lack of physical activity." The responses from the companies he targeted were predictable. A spokesperson for Coca-Cola said, "no one single food or beverage alone is responsible for people being overweight or obese." In line with the theme highlighted above, the spokesperson added, "We are also helping people be physically active and our three-year partnership with StreetGames will connect 110,000 young people with sport and create a new generation of coaches. Coca-Cola sponsors more than 250 physical activity and nutrition education programmes in more than 100 countries and we are committed to sponsoring a programme in every country that we operate in by the end of 2015." In response to a CNN special on the same topic, Jill McDonald, CEO of McDonald's UK, stated, "We also support hundreds of grassroots sports and volunteering programs across the UK through our long-term association with football and the Olympics."¹²⁷ Jacques Rogge, the International Olympic Committee President, backed down from his stand that there was a "question mark" over the involvement of food companies as sponsors, by renewing their contracts and saying, "Both companies bring forward the spirit of the Olympic Games through creative and engaging global programmes that promote physical activity and the values that the Olympic Games are all about."¹²⁸

The benefits of sponsoring the Olympics are evident—it is the world's largest sports event, viewed by many millions of people for weeks at a stretch. The benefits of exclusive selling rights at such events are equally evident. Food companies are among the biggest spenders on advertising, and sports events are among the most

widely viewed entertainment options available. Yet, the concentration of food companies on the sponsorship of major sports teams and events is uncanny. McDonald's and Coca-Cola sponsor not just the Olympics, but also the FIFA World Cup and UEFA soccer. Coca-Cola also sponsors the NBA, and McDonald's sponsors multiple NBA teams. Meanwhile PepsiCo sponsors the NFL, Major League Baseball, Major League Soccer, multiple NBA teams, the ICC Cricket World Cup, and the Indian Premier League. The list is long, and the coverage almost exhaustive.

Conclusions

The food industry has responded to the obesity crisis usually by calling for personal freedom, choice and responsibility, and minimal or no government intervention. In contrast, many public health experts and social activists have argued that there are systemic causes of the obesity crisis, and have called for significant government action such as sin taxes and restrictions on marketing of foods considered unhealthy. Tilting to the systemic side of this debate, several countries have implemented significant governmental interventions of various sorts. The balancing point in the public and political debates about public health in the U.S. has moved decisively towards the individual side of the scale in the late twentieth century.¹²⁹ In the U.S., such governmental interventions have been viewed as heavy-handed, and attracted much political, and even popular, opposition.

For example, then-Mayor Michael Bloomberg supported an initiative to limit the size of soft drinks sold in New York City. The law, which was to take effect on March 12, 2013, was intended to apply to sodas and other sugary beverages larger than 16 ounces (0.5 liters) sold in restaurants and other eateries, but not in groceries and convenience stores. Compared to soda taxes, this was a rather mild government intervention. In spite of that, this became a controversial proposal and attracted much attention throughout the country. Beverage manufacturers, restaurants, and other business groups lobbied strongly against the proposal, calling it an illegal overreach that would infringe upon consumers' personal liberty. A *New York Times* poll suggested that 60% of New Yorkers were against the measure.¹³⁰ The New York Supreme Court invalidated the law, and an appeals court also ruled against the proposed law.¹³¹ A spokesman for the American Beverage Association, which brought the lawsuit on behalf of companies such as Coca-Cola, PepsiCo, and Dr Pepper Snapple, said the ruling was a "sigh of relief" for New Yorkers and small businesses throughout the city. McDonald's Corporation said customers ordering a large coffee would be handed as many packets of sugar as they like on the side, to be poured into the drink at the customer's leisure.¹³²

Without taking sides in this prior debate, we have offered a novel argument that holds the food industry at least partially responsible for the obesity crisis even if we grant their central premise of individual responsibility for making good choices. Individuals making these choices are guided by their lay theories of obesity. In this article, we have presented empirical evidence that laypeople's beliefs about the causes of obesity often do not dovetail with medical consensus, and that people who believe that insufficient exercise is the primary cause of obesity tend to be heavier than those who implicate poor diet. Further, we have identified four channels of corporate

messaging that food companies have used to deflect the public discourse from bad diet to exercise and other factors, likely leading to misinformed lay theories of obesity, which in turn is associated with increased actual obesity. All food companies proclaim they are responsible corporate citizens and are taking steps to help tackle the problem of obesity; however, these steps may be shackled by the fact that food companies also have a fiduciary responsibility to their shareholders to increase profits. The problem is exacerbated by the fact that exercise-related companies, such as sports equipment manufacturers and health clubs, also have no incentive to promote the diet theory. Who, then, promotes the diet theory, which is most strongly supported by medical research? Curiously, though, the above companies are almost completely absent from the sponsorship of the one major global sport that does not involve exercise—Formula 1.

Our point is not to ascribe malicious intent, but rather to identify a pattern and determine its possible consequences. Given the current landscape, it is our view that it is the responsibility of the government to promote the diet theory both directly and indirectly. The government could attempt to directly educate the public about the significant role of a bad diet in causing obesity. For example, in 2012 New York City's health department released a set of posters depicting the steady increase in sizes of soda cups and sleeves of French fries against backdrops of unhealthy people, including a diabetic man who is missing most of one leg.¹³³ The ads, which appear in the subway, warn that obesity and diabetes have become more common as the average size of food servings has risen. One possible way to fund such education efforts could be through a tax on food advertising,¹³⁴ in a manner somewhat parallel to how anti-smoking campaigns were partly funded by taxes on tobacco. Similar to our proposal, but based on different reasoning, House Representative Rosa DeLauro (Democrat-Connecticut) introduced a bill in the U.S. Congress, backed by four other Democrats, that would take away the ability of food companies to claim a tax deduction for marketing "unhealthy food products to children."¹³⁵

The government could also indirectly help educate the public and reduce the misinformation communicated to the public by imposing some restrictions on food advertising. A possibility is to require warnings about the linkage between a bad diet and obesity, somewhat akin to the warnings required on tobacco ads and packages. For example, French law requires that messages on the benefits of balanced diets accompany all television and radio food ads.¹³⁶ Also, China, Denmark, Finland, Malaysia, Korea, Romania, and the United Kingdom have regulations that encourage balanced diets and/or prohibit the presentation of snacks as replacements for meals.

Promoting exercise is a worthwhile public health endeavor for many reasons, but it has two major shortcomings in the battle against obesity. The first, as we have argued, is that it does not tackle the main cause of obesity—overnutrition. The other is that a focus on exercise directs attention to other public policies that promote physical activity, rather than ones that target food. To the extent that government actions promote exercise, it would be useful to indicate the relatively small effect on being overweight and obese.

Overall, our recommendation is for systematic public health communications to promote the diet theory. This would educate the public that bad diet is the primary

cause of obesity and thus help fight the obesity crisis, even while supporting individual choice and responsibility. Such an approach might be useful and politically pragmatic in both countries that lean towards the individual side of the scale (such as the U.S.), and countries that favor systemic governmental action (such as the Scandinavian countries). Not only would this increase awareness among laypeople thereby helping fight the obesity crisis, but, in so doing, would also reduce the incidence of leanwashing.

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