HEALTH & MEDICINE

LABEL NUDGES?

A connection between nutritional labeling and improved health is more hope than well-examined theory.

BY MICHAEL L. MARLOW

Behavioral economists frequently argue that well-designed "nudges" can steer individuals toward smarter decisions that enhance their welfare. In their book *Nudge*, Richard Thaler and Cass Sunstein argue that government "choice architects" can nudge individuals away from numerous unconscious and irrational decisions that stem from a whole host of psychological, social, cognitive, and emotional factors. Over-eating, inadequate retirement saving, and smoking are a few examples of behavior believed to benefit from nudges. Thaler and Sunstein further argue that nudging is "libertarian paternalism" because, unlike taxes and bans, nudges can be ignored at little cost, preserving freedom of individual choice.

Recent surveys indicating that around half of Americans want to lose weight. Nudge theorists place much of the blame for rising obesity in the United States on food sellers for exploiting flawed decisionmaking skills. For example, Thaler and Sunstein write, "The key point here is that for all their virtues, markets often give companies a strong incentive to cater to (and profit from) human frailties, rather than to try to eradicate them or to minimize their effects." This viewpoint presumes that individuals are often outmatched by the marketing prowess of profit-maximizing sellers. It also explains why nudge theorists are committed to protecting individuals whom the theorists believe to be somewhat helpless against the temptation of "unhealthy" eating.

One proposed nudge is a government mandate that food purveyors disclose information on calories and other attributes of their foods. In this article, I examine these policies in an attempt to determine the likelihood they will have the positive health effects their advocates desire.

NUDGING CHOICES

Behavioral economists believe that individuals can be irrational and thus make decisions that harm themselves. These behaviors

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are believed to stem from numerous unconscious decisions. "Mindless eating," for instance, characterizes individuals believed to underestimate their food intake. Nudges aimed at educating individuals are one remedy often proposed to nudge mindless eaters toward more "mindful" eating.

Systematic behavioral biases fall into two broad categories. First, "bounded willpower" problems arise when individuals suffer from persistent self-control problems associated with hyperbolic discounting. Individuals are said to exhibit "time inconsistency" about discounting future tradeoffs between their present and future selves. For example, an overweight person finds it hard to skip desserts but still wants to lose weight in order to improve long-term health. Mandating nutritional labels is based on the assumption that individuals will be nudged toward greater understanding of short-term and long-term tradeoffs on their health.

A second category focuses on "cognitive biases" that prevent individuals from pursuing actions that improve their welfare. For example, a status-quo bias might lead individuals to stick with what they have rather than search for better alternatives when people disproportionally prefer the status quo to changing their routines. One common example is retirement saving plans. Traditionally, employees have had to "opt in" to these plans and status quo bias results in large number of workers failing to take full advantage of these plans' rich tax advantages. Research demonstrates that simply changing the default so that workers are automatically enrolled in these saving plans and must opt out in order to not participate results in substantially higher saving while maintaining the employee's freedom. This supports the theory that nudging individuals can improve their welfare.

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Food choices / What is unique is that nudge theorists do not directly propose taxes or bans—forms of hard paternalism—as remedies to "bad" choices. Instead, nudgers simply want to realign how choices are presented to people in the hope that the realignment will encourage "better" decisions.

Consider, for example, how a nudge could reduce the likelihood that already-full restaurant customers would eat calorie-rich desserts after their meals. Many restaurants include their dessert offerings on the main menu, tempting consumers to order dessert along with the rest of their meal, when they are hungry. Changing this so that consumers see the dessert menu and place their order only after they have completed their entrees may nudge diners toward weight loss.

Other potentially slimming default restaurant choices might include making quarter-pound burgers "standard" instead of one-third pound burgers (though the latter would still be available), reducing glass capacity from 16 ounces to 10 ounces, and making one slice of cheese

standard on cheeseburgers instead of two (though, again, two would be an option). Eating behavior researcher Brian Wansink also recommends, for example, storing tempting calorie-rich foods in less convenient locations (such as basements or top cupboards) instead of someplace ready-to-hand; replacing short, wide glasses with tall, narrow ones so the drink will seem larger; and using smaller spoons so, again, the portion will seem larger than it is.

The importance of environmental cues in combating weight-gain is another research area. One study of vending machines examined whether posters showing health-evoking, but not directly food-related, images led to more sales of "healthy" over "unhealthy" foods compared to no posters or posters with a hedonic-evoking motif. Posters associated with health increased "healthy" food purchases, but those associated with hedonism increased "unhealthy" food choices. Another field study suggests using the "Giacometti effect," a term used to describe the famous skinny, human-like sculptures by Alberto Giacometti (1901–1966). The authors found that using images of Giacometti sculptures as environmental cues facilitated dieting by reducing motivated eaters' "unhealthy" food intake of chips.

Labeling / Nudge theorists believe that nutritional labels that list calorie and other attributes of foods sold in supermarkets and restaurants help nudge consumers toward more healthful dietary choices. Toward that end, the federal Nutrition Labeling and Education Act of 1990 requires mandatory "Nutrition Facts Panels" on most packaged foods. Since 2008, various cities, counties, and states have required restaurants to post calorie and other nutritional information on their offerings. New York City, for example, implemented mandatory calorie labeling in July 2008. The Affordable Care Act of 2010 requires that beginning December 1, 2016, restaurants post calorie information for standard menu items on menus and menu boards, along with a succinct statement about suggested daily caloric intake. Other nutrient information—total calories, calories from fat, total fat, saturated fat, trans fat, cholesterol, sodium, total carbohydrates, fiber, sugars, and protein—also must be available in writing on request.

The question is, do these labeling nudges actually improve consumers' health?

PROBABILITY MODEL

The basic framework for nudging health gains through nutritional labels is deceptively simple. The extent to which labeling changes health outcomes is proportional to the occurrence of each of the following four steps:

- Consumers read the labels.
- Consumers understand the labels.
- Consumers, as a result, improve their food choices.
- Consumers, as a further result, experience improved health.

Let us first consider an optimistic scenario in which each of the above four steps is associated with a 50% probability. That would mean the joint probability of all four steps occurring is 50% × 50% × 50% × 50% = 6.25%. In other words, roughly one in 15 people would experience improved health.

Now consider a less optimistic scenario in which each step is associated with a 25% probability. The joint probability of all four steps occurring would be 25% × 25% × 25% × 25% = 0.39%. In this case, only about one in 250 people would benefit from the labeling nudge.

An even more pessimistic scenario associates only a 10% probability with each step. The joint possibility of all four steps occurring would be 10% × 10% × 10% × 10% = 0.01% under this scenario. That is, only one in 10,000 people would benefit.

Thus, the expectation that nutritional labels nudge individuals toward improved health is dependent upon the probabilities associated with each step. The higher the probabilities, the greater the likelihood that labels improve personal health. Even if each step is high-probability, aggregate improvements in health are unlikely because all four steps must occur.

We now discuss what the empirical literature suggests about how consumers behave within the four-step model outlined above.

STEP 1: WHAT PERCENTAGE OF CONSUMERS NOTICE LABELS?

The traditional case for informing consumers stems from arguments that markets are imperfect and thus do not fully convey information about product attributes. One market imperfection arises from "public goods" properties of information. That is, firms conducting research absorb all of its costs, allowing other firms to "free-ride" on the benefits of that research without incurring costs. Firms are thus less likely to find such research profitable. Information on product attributes will therefore be inefficiently provided in markets. Moreover, as previously discussed, nudge theorists often blame food sellers for exploiting decisionmaking flaws of consumers, a view consistent with the prediction that sellers will not fully disclose "unhealthy" food attributes to consumers.

But risk communication regarding food—whether by businesses or governments—is inevitably an imperfect endeavor. Effective communication requires that consumers receive information in forms easily understood, which generally means short, succinct wording rather than long and complex claims.

Grabbing the attention of consumers also requires informing them about food attributes that they care about. While many people (65%) said in the 1990s they used food labels to check for things they were trying to avoid, that figure dropped to 48% in 2013. Research using eye-tracking technology also indicates that self-reported reading of labels overestimates actual reading. One study tracked the visual attention of individuals making simulated food-purchasing decisions to assess nutritional label viewing. Results indicated that consumers' self-reported label use does not accurately represent in vivo use of labels when consumers engage in a simulated shopping exercise. In addition, only

9% of participants actually looked at calorie counts for almost all (80% or more) of the products in the study, and about 1% of participants looked at all other components (e.g., total fat, trans fat, sugar, and serving size) on almost all labels.

Although nudge theorists believe consumers need to know more about calories, fat content, or other nutrients, studies clearly point to *taste* as the most important attribute of purchase decisions. The importance of taste suggests why many consumers are not so enthusiastic about reading food attribute labels. Taste is the biggest factor in a snack purchase, according to 66% of baby boomers and 53% of millennials in a 2016 survey by consultancy Alix Partners.

In sum, grabbing consumers' attention is the first step in nudging them toward improved health. However, many consumers may not notice labels because they do not directly indicate taste—a most important food attribute to consumers. Consumers who notice labels may also be partially informed prior to label regulations, thus suggesting that benefits from this first step in the probability model are overstated.

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STEP 2: WHAT PERCENTAGE OF CONSUMERS READING LABELS UNDERSTAND THEM?

Research indicates that many consumers—especially infrequent label readers and less educated individuals—struggle to interpret food labels. This notion was echoed by then–First Lady Michelle Obama in a 2010 speech when she described her own food-shopping experiences: "The last thing I had time to do was to stand in a grocery store aisle squinting at ingredients that I couldn't pronounce to figure out whether something was healthy or not." A survey conducted in 2012 by the International Food Information Council Foundation also indicates that consumers struggle to understand food labels. Most Americans (52%) concluded that figuring out their income taxes was easier than knowing what they should and should not eat to be healthier.

Information overload is a potential problem that is believed to cause consumers to resort to heuristics in order to simplify the task. Consumers often pick just one nutrient, such as fat content or calories, rather than attempt to understand the entire list of information placed on a label. Consumer focus on taste may also trump interest in "healthy" attributes, especially when "unhealthy" eating is perceived to be tastier than "healthy" food. While 90% of respondents in one recent survey indicated they give at least a little thought to the ingredients in their food and beverages, taste (87%) remained the most significant determinant of choices, followed by price, and then healthfulness.

Ironically, behavioral economics itself suggests how imprecise nutritional labels may be in nudging "healthier" eating when consumers are truly irrational. Behavioral economics predicts that effective labeling requires knowledge of the cognitive processes of recipients by those transmitting the information. Sellers themselves may also not possess adequate information on product attributes and the cognitive processes of consumers. Labels may nudge consumers toward "unhealthy" eating under these conditions. The possibility also remains that mandated labels create incentives for businesses to reformulate their products in ways that make their products look more appealing to consumers, but those reformulations may not really be healthier.

A case in point comes from research indicating that consumers often believe that foods that are lower in fat are beneficial for weight management. In fact, the vast majority of products with fat claims (e.g., "low fat" and "reduced fat") are not significantly lower in calories than products without such claims. One study found that "low fat" labeling led participants to eat 28.4% more (54 calories) M&M candies and 50.1% more (84 calories) granola than when they were labeled as "regular." The same study also found that low fat labeling of the M&Ms led to greater consumption among overweight compared to normal-weight participants.

Evidence also indicates that, although the percentage of consumers who used serving size information "often" or "sometimes" increased from 54% in 1994 to 64% in 2008, one-half of respondents also misinterpreted the meaning of serving size, which is a manufacturer-stipulated amount of some food or beverage. Many consumers fail to understand the difference between serving size and portion size, which is how much a consumer typically eats in one sitting. A serving typically is considerably smaller than a portion. Women and obese individuals were more likely to use serving size nutritional information often or sometimes, but were also more likely to misinterpret the meaning of serving size. Women and participants who were younger, less educated, and obese were also more likely to incorrectly believe that serving size indicates a recommended portion of food.

Recent mandated changes to the Nutrition Facts Panel reflect a simple re-packaging of the original label created over 25 years ago. Changes include highlighting "calories," "servings per container," and "serving size" by increasing the type size and placing the number of calories and the "serving size" declaration in bold type. The new labels must also display actual amount, in addition to percent Daily Value, of the mandatory vitamins and minerals, and manufacturers must add "Includes *X* g Added Sugars"

directly beneath the listing for "Total Sugars." It remains unclear why policymakers think these revisions will significantly improve cognition. Nothing suggests that the percentage of consumers reading and understanding nutrition labels will increase.

In sum, for consumers nudged to notice labels, understanding them is the second step in the causal chain of events necessary to improve personal health. Nudging consumers through mandated nutritional labels remains problematic as long as labels do not directly indicate taste—the most important attribute for consumers. Little to no research indicates much support for the theory that consumers who notice labels are also likely to understand them in ways intended by nudge theorists.

STEP 3: WHAT PERCENTAGE OF CONSUMERS READING AND UNDERSTANDING LABELS WILL THEN EAT HEALTHIER?

There is little support for the prediction that nutritional labeling nudges consumers toward healthier diets. This should not be surprising given the above discussion of problems consumers experience understanding—or even noticing—labels. Although studies find calorie labeling improves calorie estimates by consumers, healthier eating does not usually follow. One paper concluded that the Nutrition Facts Panel had no effect on dietary intakes of total fat, saturated fat, or cholesterol.

A study of New York City's 2008 law requiring restaurant chains to post calorie counts finds no change in calories purchased following the implementation of the law. A similar conclusion is reached in research on menu-labeling regulation in King County, Wash. A study of mandatory calorie posting on purchase decisions at Starbucks finds virtually no change in purchases of beverage calories. The same article finds that posting calorie benchmarks on labels also failed to promote healthier eating. Calorie labeling did not influence what patrons of a large chain bakery café ordered for lunch.

Labeling that combines caloric information with "exercise equivalents" also does not clearly alter food selection. Exercise equivalents define how much time engaging in a particular physical activity is needed to burn off calories in foods. For example, a 300-calorie hamburger requires about 75 minutes of walking. Pairing exercise equivalents with caloric information is an attempt at simplifying nutritional labels to promote decreases in overall energy intake. One paper concluded that this approach did not alter calories ordered by a sample of 62 females, ages 18–34, who ordered fast food meals.

In sum, little evidence exists that, even if mandated labels are read and understood by consumers, they will alter their diets in ways predicted by nudge theorists. The empirical literature thus provides little evidence that the third stage of the probability framework helps people make changes in their diets to lose weight.

STEP 4: WHAT PERCENTAGE OF CONSUMERS WHO READ AND UNDERSTAND LABELS, AND THEN ALTER THEIR DIETS, EXPERIENCE IMPROVED HEALTH?

Studies rarely examine effects of labels on disease, weight, or any other measure of personal health. The standard presumption appears to be that decreasing eating of foods targeted as "unhealthy" necessarily improves personal health. However, research on the taxing of "unhealthy" foods finds that, instead of reducing calorie consumption, consumers often respond in undesirable ways not envisioned by policymakers.

One study found that, while soda tax hikes decrease soda consumption among children, no change in total caloric intake occurred because the children increased their consumption of other high-calorie beverages. Another paper documents how tax hikes on various foods steer consumers into purchasing a wide array (23 categories) of other food and beverages. There is little reason to suspect that nutritional nudges are immune to similar inadvertent effects on diet behaviors that at least partially overturn policy goals.

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Another problem is that these nudges are often based on the conventional wisdom that obesity is linked to over-consumption of fast food, soft drinks, and candy as opposed to food generally. A 2015 study finds such generalization is misleading. The epidemiological relationship between frequency of intake of these foods and body mass index (BMI) was found to be driven by the extreme tails (+/– 2 standard deviations) of the data distribution. The consumption incidence of these foods was examined across discrete ranges of BMI using data from the 2007–2008 National Health and Nutrition Examination Survey. After excluding the clinically underweight and morbidly obese, consumption incidence was not positively correlated with measures of BMI. The authors concluded that a clinical recommendation to reduce these foods may have little relevance to 95% of the population because, for 95% of this study's sample, the association between the intake frequency of these foods and BMI was mildly negative. The authors concluded that making generalizations and assumptions based on statistical extremes can lead to policies that are ineffective for the extremes of the distribution and irrelevant for most everyone else.

In sum, little evidence supports the prediction that, if labels are read, understood, and cause diets to change, personal health improves. Few studies even address this fourth stage of the probability model. Rather, studies focus on whether nutritional nudges influence consumption of targeted foods and not whether changes in weight or other measures of quality of life occur.

CONCLUSIONS

The case for nutritional nudges is epitomized by Thaler and Sunstein's proclamation, "It would be quite fantastic to suggest that everyone is choosing the right diet, or a diet that is preferable to what might be produced with a few nudges." Nudgers advocate nutritional labeling on the assumption that there is a simple linear relationship between the availability of nutritional information and behavioral changes that improve public health. At the heart of this paradigm is the belief that a rational and well-informed policymaker exists who easily chooses among the available alternatives to protect consumers from personal destructive behaviors. The reasoning consumer is then assumed to understand and use complex nutritional labeling designed by the policymaker to overturn "irrational" choices. Yet such rationality by both policymakers and consumers would appear to be out of place within the world of behavioral economics.

My four-step probability model demonstrates that the conventional case for informational nudges is far too simplistic. My model demonstrates the importance each probability plays in determining whether or not labels improve personal health. A few simple simulations suggest that the conventional case for mandated nutritional labels is lacking. That suggestion is reinforced by the empirical literature on human behavior.

A critical shortcoming of conventional nudge research is its focus on whether nudges have altered consumption of one or more targeted items without controlling for whether food substitutions arise that undermine weight-loss efforts. An even larger problem is that studies showing that nudges influence food choices employ a very low bar for defining success. True success is when nudges improve personal health and is not necessarily identical to cases where nudges reduce the intake of specific foods deemed unhealthy. Conventional research thus sets a very low bar for success of these policies. Improved health is a much higher bar for success that nudge theorists should shoot for. So far, the connection between nutritional nudges and improved health is more of a hope than a well-examined theory.

The bottom line is that nudge theorists have a lot of work to do. Their enthusiasm over their ability to design nutritional nudges that translate into improved health lacks theoretical and empirical support. Their measures for success are also embarrassingly modest.

My probability model demonstrates the wishful thinking of their enthusiasm for nutritional nudges. In effect, mandated nudges reflect ongoing "heroic policymaking" characterized by policymakers experimenting on citizens. This article offers a more scientific framework for modeling the effects of informational nudges that can foster a less heroic but more realistic set of policies aimed at improving public health. *R*

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