HHS Public Access

Author manuscript

Obes Rev. Author manuscript; available in PMC 2017 May 01.

Published in final edited form as:

Obes Rev. 2016 May ; 17(5): 389–396. doi:10.1111/obr.12387.

Obesity Prevention at the Point of Purchase

Deborah A. Cohen, MD, MPH and
RAND Corporation

Lenard I. Lesser, MD, MSHS
Palo Alto Medical Foundation Research Institute

Abstract

The point of purchase is when people may make poor and impulsive decisions about what and how much to buy and consume. Since point of purchase strategies frequently work through non-cognitive processes, people are often unable to recognize and resist them. Because people lack insight into how marketing practices interfere with their ability to routinely eat healthy, balanced diets, public health entities should protect consumers from point of purchase strategies. We describe four point of purchase policy options including standardized portion sizes; standards for meals that are sold as a bundle, e.g. “combo meals”; placement and marketing restrictions on highly processed low-nutrient foods; and explicit warning labels. Adoption of such policies could contribute significantly to the prevention of obesity and diet-related chronic diseases. We also discuss how the policies could be implemented, along with who might favor or oppose them. Many of the policies can be implemented locally, while preserving consumer choice.

Keywords

obesity; point of purchase; marketing; public policy; impulse buying

Introduction

Of all the things our society could do to reduce the burden of obesity and other diet-related chronic diseases, interventions at the point of purchase holds an enormous potential. The point of purchase is when people make their decisions about what and how much to buy and to consume, for themselves as well as for their families. The point of purchase is the setting where people are challenged to either follow through on their long-term goals to stay healthy or are tempted to buy and consume foods that will increase the risk of weight gain, hypertension, diabetes, and cancer. The point of purchase is also a bottleneck—if a product is not available or conveniently accessible, it cannot be readily consumed, regardless of the amount of marketing a consumer encounters beforehand. This paper reviews why people are vulnerable to point of purchase marketing as well as the evidence that point of purchase marketing leads people to overeat in restaurants and to buy highly processed low-nutrient

Corresponding author: Deborah A. Cohen, MD, MPH, RAND Corporation, 1776 Main St, Santa Monica, CA 90407, 310 393-0411 ext 6023, fax 310 260-8175, dcohen@rand.org.

Conflicts of Interest: The authors have no conflicts of interest to disclose.

foods in supermarkets. Routine exposures and the associated habitual overconsumption could increase the risk of obesity. We suggest several novel policy options that could mitigate the harm from point of purchase marketing, while not compromising individual freedom of choice.

The Physiology and Psychology of Human Vulnerability to Point of Purchase Marketing

The two different ways in which people process information—cognitively and non-cognitively- have important consequences on the decisions we make.[1] The non-cognitive system (also known by psychologists as *System 1*) operates automatically and quickly, with little or no effort and no sense of voluntary control.[2,3] The cognitive system (*System 2*) operates more slowly to solve more complex problems that require deliberate choice and concentration. For cognitive efficiency, and particularly for routine tasks, the brain prefers to use System 1.[4] Food decisions using *System 1* typically take less than one second to make [5] and favor short term benefits and superficial characteristics, like appearance, price, positioning, and convenience. For example, *System 1* decision-making from a menu can be influenced by the order, the font size, or the descriptors (e.g. crunchy, fresh, tasty) regardless of food constituents.[6] Similarly, *System 1*-generated choices in a retail outlet may depend on whether items are at eye level or on an end-aisle display.[7] In contrast, *System 2* has the capacity to analyze beyond the superficial presentation and information available at a glance, but requires relatively greater amounts of mental energy and attention to do so. Thus, few people can use System 2 routinely for all daily eating occasions. System 2 has a finite capacity; when it is fatigued of depleted, System 1 takes over.[8] The limited capacity of *System 2* explains why many dieters develop problems with decision-making[9] and why they are more likely to lose self-control under stress or at the end of a day.[10]

Businesses can lead people to make choices contrary to their own long-term health by triggering hard-wired non-cognitive processes via our senses, which operate automatically and reflexively. When food is present, people's gaze preferentially orients toward the food,[11] largely because individuals lack full control of their eye movements, which respond reflexively to environmental stimuli. Even when people have just eaten more than they need, exposure to tempting food can set in motion a hormonal cascade, which prepares the body for ingesting. Salivation and the release of digestive hormones and insulin, occur automatically, increasing feelings of hunger. Dopamine is released which can lead to desire and cravings.[12] Cues and food triggers can convert people to a "hot" state, in which System 2 is not available to think about the long-term consequences.[13] Given the increasing ubiquity of convenient, accessible low-nutrient foods, over 90% of adults under age 70 consume an excess of discretionary calories.[14]

Other limitations most people face in making food decisions include the inability to accurately estimate the volume, calorie, or nutrient content just by looking. Foods are typically not sold in serving units that are compliant with the United States Department of Agriculture's (USDA) or other countries' recommended serving standards. Every restaurant has its own standards for serving sizes, and most serve meals that contain more calories than

people can burn.[15] In supermarkets foods are often sold by the pound or are packaged with multiple servings, making it difficult for people to know how much to consume, unless they use measuring tools. Although many have the knowledge and skills required to recognize and consume a healthy diet, they may be too preoccupied or rushed to do this, especially because eating occurs multiple times a day in an environment when so many other issues take up all the attention and mental capacity available. Eating has evolved to occur automatically, allowing individuals to engage in other activities, including socializing with dinner companions or attending to children, while they eat as a secondary behavior without conscious direction.[16] When multitasking includes eating, people usually pay minimal attention to the food at hand and eat without tracking how much is being consumed. (This explains why self-report of food eaten is so unreliable.)

Even when people are fully educated about food and nutrition, it can be difficult to ignore ultra-processed unhealthy foods. Eating is highly rewarding; in contrast, we typically experience negative feedback from refusing or resisting foods. Table 1 lists a variety of factors that make people vulnerable to an abundant food environment, including varying capacities for self-control, decision fatigue as well as being naturally responsive to conditioning and priming cues that marketers use to promote their products.

Although there is a huge food system with multiple elements, from the producer to the processor, that influences what foods people desire and choose, the point of purchase is an important leverage point. At the point of purchase, sellers can influence choices, merely by the way items are presented and framed. These manipulations can potentially counteract upstream efforts promoting unhealthy products.

Point of Purchase Marketing Strategies and How They Work

The food industry, as well as all other commercial ventures, knows that how products are presented has an enormous impact on consumer behavior. In fact, it was recognized in the 1970's that store factors (i.e. layouts and promotions) are more important than any customer-level factor in influencing purchases.[7,17] Since then, in the US and elsewhere, the food industry has been investing more into in-store marketing. In the US expenditures for in-store marketing increased from 28% of marketing budgets in 1968 to 68% (about $75 billion) in 2009.[18,19] Prior to in-store marketing innovations initiated four decades ago, most people were able to maintain a healthy weight without having to work at it. By capitalizing on human vulnerabilities, aggressive industry marketing overwhelms System 2 and fosters impulsive, quick responses to readily available, inexpensive foods.[20] Special supermarket in-store displays like candy at the cash register are in many countries, although they have been discontinued in some chains, like Tesco in the UK,[21] and are being phased out in other places like in the Woolworths chain in South Africa.[22]

Impulse marketing is intended to disrupt cognitive, thoughtful decision-making and promote instant gratification. Manufacturers promote the sales of low-nutrient foods in ways that encourage spur of the moment, emotion-related purchases that are triggered by contextual cues, including seeing the product or related messages. Classical conditioning and priming are among the most common psychological techniques employed. Classical conditioning

takes advantage of the perception that when two things are paired, the qualities of one are transferred to the other. For example, the use of branding, celebrity endorsements, logos, and special packaging triggers associations between food products and outcomes that are unrelated to food—including feelings of power, excitement, fun, and sexual attractiveness. Although in theory, adults should be able to recognize and resist such ploys, research in cognitive science and psychology shows that few people can routinely apply rational cognitive processing in a manner that enables consistent rejection of foods that increase the risk of chronic diseases.[23] Priming is another strategy that works in ways people generally fail to recognize. People can be primed simply by being exposed to a stimulus, which automatically influences a response to another stimulus. For example, seeing an outdoor advertisement for a food primes the brain to prefer that food once the consumer gets to the restaurant.[24] Table 2 is a partial list of point of purchase marketing strategies.

It is unlikely that the food industry intends to make people sick. Given the low cost of food, serving portions that are too large may increase profits, particularly when the superficial perception of consumers is one of more value for the money. Supermarkets feature low-nutrient foods prominently because much of their shelf-space is being purchased by the companies who want to display their goods in these salient locations.[25] A public company's primary fiduciary responsibility is to increase profits. With profit as the primary objective, the food industry has no innate incentive to concern itself with the consequences of their marketing on consumer health, unless doing so increases profits.

Novel Interventions to Protect People from Point of Purchase Marketing of Unhealthy Food

Just as public health regulations exist to ensure that businesses do not intentionally or inadvertently harm consumers (e.g. standards for potable water, mandates for seatbelts and airbags in cars, prohibitions against lead in toys), measures are needed to protect consumers from harmful products.[26] While consumers should be free to make choices, businesses should not take advantage of cognitive biases that divert consumers from making decisions congruent with their own long-term self-interests. Most public health measures to encourage healthy eating do not take into account the scientific evidence as to how context influences both the type of cognitive processing that occurs as well as the choices that are made. Instead, most interventions have focused on education to change individual action or by making certain foods, like fresh fruits and vegetables, more accessible. But education only works when *System 2* is working. And the availability of healthy foods may not be able to counteract the lure of even more accessible highly processed low-nutrient foods. We underestimate the impact of the point of purchase on what people buy and eat. Yet it is the most critical place for action, as this is where most food decisions are strongly influenced.

We propose new point of purchase interventions, listed in Table 3, to be applied at establishments selling food prepared for immediate consumption and at grocery stores, where people will take the food home and prepare it elsewhere for later consumption. All the interventions are intended to assist consumers in moderating their food intake, aid in

transparency, reduce impulsive decision-making, and facilitate (but not dictate) thoughtful choices in line with an individual's long-term goals.

1) Standardized portion sizing

Given that individuals lack the capacity to estimate size just by looking,[27] standardizing portions for foods eaten away from home would establish the reasonable quantity for a single serving that would not put people at risk for a chronic disease were they to eat that quantity with great frequency. The standards should reflect a portion size to be consumed at one sitting, and could guide restaurants in how much food to put on a customer's plate. (This is in contrast to the new Nutrition Facts Label, which reflect the total quantity in a package, and unfortunately, appears to be confusing to consumers.[28]) Since excess weight gain and chronic disease are frequently attributable to discretionary calories, standardizing portion sizes is most relevant to these foods, which include snack foods and desserts. The exact amount of discretionary calories available to individuals depends on the quality of each person's diet and activity level. For the average American requiring a 2000 calorie diet who does not want to gain weight, discretionary calories should not exceed 300 calories. Indeed, persons who are overweight are advised to forego all discretionary calories in order to achieve their target weights.[29]

To assist in determining appropriate portions of foods, the U.S. Food and Drug Administration (FDA), for example, has established "Reference Amounts Customarily Consumed" (RACC). These were mostly developed based upon what people typically ate in one serving, before the current obesity epidemic in the early 1980's.[30] RACC serving sizes for foods with discretionary calories are highly varied and need to be reviewed and updated. For example, the RACC serving of cheesecake is 125 grams, which is about 400 calories. This would exceed the recommended daily discretionary calories and the American Heart Association's recommended limit for added sugar for women.[31] The FDA along with other countries could update or establish serving sizes of discretionary calories so that restaurants and public health officials know the amount of food that would prevent individuals from being automatically served too much of any particular food, nutrient, or macronutrient.

Another way to classify an acceptable portion size is to consider the upper limits associated with chronic disease. Many countries follow standards to protect air and water, for example. The Institute of Medicine (IOM) has established two systems: one for nutrients, the Daily Tolerable Upper Intake Level (UL), and another for macro-nutrients, the Acceptable Macronutrient Distribution Range (AMDR), which is the range of intake for a particular energy source that is associated with reduced risk of chronic disease while providing intakes of essential nutrients. If an individual consumes in excess of the UL or the AMDR, there is a potential of increasing the risk of chronic diseases and/or insufficient intakes of essential nutrients.[26] Following these guidelines would, for example, limit a single serving to no more than 2300 milligrams of sodium. The IOM also states that added sugars should not exceed 25% of total calories (or 500 calories/2000 calorie diet), although the American Heart Association considers the upper limit to be 100 calories for women and 150 for men.[31] Standard serving sizes of individual foods should not exceed these recommendations, but

might be established as one third or one-half the maximum daily amount, given that people typically eat more than once per day.

Just as standards for servings of an alcoholic beverage limit a single serving of beer, wine or spirits to 0.6 oz. of ethanol, but do not prohibit customers from ordering as many drinks as they want, standardized portions will not limit individual consumption. It would empower people to choose how much they consume and would counteract point of purchase nudges that increase the risk of chronic diseases. Revising the RACC to account for the upper daily limits of particular nutrients like sugar and for recommended discretionary calories and applying it to food served away from home is necessary to prevent inadvertent overconsumption and provide transparency.

2) Meal Standards

Most restaurants serve meals that do not adhere to standards that prescribe a balanced meal, like the US “My Plate” guidelines[15] or Mexico’s El Plato del Bien Comer (The Plate of Good Eating.[32] The consequence is that when people dine out, they typically fail to get sufficient fruits, vegetables and whole grains, and they consume too many calories. Bundling of foods together is problematic for consumers because bundling often leads consumers to buy and eat items that they otherwise would not have ordered, but for the bundling. When a meal is bundled in a “combo meal”, it gives the impression that is both a bargain and a reasonable choice for a consumer to make. The most iconic meal, burger, fries and a 20 oz. soda, exceeds the maximum daily recommended levels of added sugar and fat and provides no fruits, vegetables or whole grains. In one study of this iconic bundled meal researchers found that the reason they are so popular, is less because of the perception of a bargain, but more because consumers have to make only one decision, instead of three.[33] This further supports the notion that people are using *System* 1 when making these food choices. To protect people from being steered toward choices that increase the risk of chronic diseases, any meal that is sold as a bundle should meet balanced meal guidelines. Ideally, since people eat three meals per day, each meal should contain approximately one-third the daily servings of fruits, vegetables, and whole grains.

In the United States, My Plate has been the basis for the Institute of Medicine (IOM) school meal program and should also be used as a standard for children’s meals away from home. The Child and Adult Care Food Program (CACFP) guidelines can also be used in away from home food service settings, and can easily be implemented with measuring cups and kitchen scales. Another set of simpler guidelines developed at a RAND consensus conference are less strict and address the main problems in the American diet: insufficient fruit and vegetable consumption, as well as excess calories. The RAND standards for an adult meal suggest a 700-calorie maximum and the inclusion of at least 1.5 cups of fruits and or vegetables.[34] Such meal standards would not prohibit anyone from ordering whatever he or she wants, but it would make the choice of meals that do not meet health standards to be deliberate, and would counter industry nudges away from healthier meals.

3) Restrictions on Impulse Marketing

Given the high rates of obesity and diet-related chronic diseases along with the low success rate of individual dieting, it is critical that efforts be made to assist consumers in moderating their intake. Impulse marketing does the opposite and encourages excessive consumption, by placing tempting, usually low-nutrient foods ubiquitously and in locations that people cannot avoid seeing, often when they are most likely to be cognitively stressed or depleted. In order to protect people from excess exposure to discretionary calories, items such as sugar-sweetened beverages, ultra-processed snacks, sweetened baked goods, frozen desserts, and candy should not be placed in salient locations, like on end-of-aisle displays nor at or near cash registers. Instead, they should be placed in areas where people would have to intentionally seek them, if they wanted them.[35] Some grocery stores have voluntarily constructed “healthy” checkout aisles, designed to prevent kids from asking for candy from their parents.[36] Although these have not been fully evaluated, this is a direction that deserves further investigation and possibly expansion.

Furthermore, impulse marketing also includes special promotional incentives like deep discounts and “3 for 2” specials. Discontinuing the application of discounts to foods and beverages associated with chronic diseases may help moderate intake. A study examining the impact of limits on promotions for alcohol concluded that these could lead to a 48% reduction in alcohol purchases and a 37% financial savings for consumers[37]—significantly more powerful than any proposed taxes.

4) Simplified Warning Labels

There are upper limits for the daily consumption of many nutrients, macronutrients, and calories in order to avoid chronic diseases. Yet many Americans are exceeding these limits on a daily basis, sometimes intentionally, but all too often only because they are unaware that they are being exposed to excessive quantities. With many Americans eating too many high calorie ultra-processed foods, warning labels on these foods could help consumers moderate their intake. For example, a warning label on a bottle of soda could state that consuming more than 8oz or 12oz per day puts women and men, respectively, at risk for heart disease and diabetes.[31] Until now, foods usually carry health claims rather than warnings, even though people tend to pay more attention to warnings than to positive messages.[38] As a precedent, both alcohol and tobacco carry warnings. Simplicity, salience, and consistency are critical to ensuring that people notice and attend to the messages. Careful pretesting of such labels will be necessary.

Implementation

The food industry is likely to welcome changes, such as standardized portion sizes, if these increase profits for restaurants. Offering smaller portions will reduce waste and may make meals more profitable. Offering balanced meals that do not exceed 700 calories also has profit potential. The national Restaurant Association claims that the largest growth sector is in healthier meals.[39] If all restaurants offered healthier meals, they might attract more customers, since those who are worried about weight gain often avoid dining out. When tobacco use was banned in restaurants in NYC, there was no negative impact and some

restaurants increased their profits.[40] When Darden restaurants adopted the promotion of mostly healthy kid's meals, revenues continued to increase.[41]

Retail outlets and food manufacturers will certainly dislike constraints on impulse marketing or the addition of warning labels to foods. Nevertheless, to make informed and thoughtful choices, people need both the opportunity to slow down their thought processes and to have cues at the point of purchase that can alert them to long-term consequences. Individuals can still choose these unhealthy products. The above proposals do not restrict choice; they advocate selling them in a way that does not take advantage of cognitive biases and limits. Governments and non-profits could also encourage healthy marketing practices through economic incentives. Legislators could reduce tax rates or provide low-interest loans for establishments that commit to some of the above practices.[42] Local governments could ease zoning and licensing processes for businesses that agree to sell standard portion sizes or reduce unhealthy point of purchase marketing. [43]

Finally, there are ways to reduce unhealthy impulse marketing without new laws. One way to advance these ideas and test whether they might make a difference is for private sector businesses, like worksites, universities, hospitals and also government agencies, including the military, to voluntarily adopt and evaluate them.

Conclusions

The public health community has not applied insights from the cognitive science of decision-making to consumer protections. We have overestimated individual capacity to ignore the ubiquity of foods and to limit consumption when served too much.

Some of the above policies could be implemented without regulations. But government action, either local or national, will be required to implement most. Today our society has conflicting perceptions of regulation. On the one hand, people demand adherence to standards that protect individuals from harm and assure the quality of consumer products. Few individuals would want to terminate the standards in place that ensure the quality of water we drink, the cleanliness of air, the safety of the cars we drive, the safety of children's toys, or the sturdiness of the homes in which we live. We want our doctors and professionals certified to assure that they are competent to offer the best treatments and advice. Standards are intended to promote individual safety and prohibit businesses from harming consumers. Standards create transparency and they provide individuals with a way to judge and to control what they are exposed to.

Standards also have the potential to level the playing field for vulnerable populations. Prior research has indicated that persons with fewer financial resources are more vulnerable to impulsive or automatic decision-making.[44,45] If regulations eliminate automaticity from choice and/or make the default option the healthiest ones, than even cognitively compromised groups have a better chance for a more nutritious diet.

Yet when it comes to protecting our population from diet-related chronic diseases we lack standards for food promotion. Some have protested previous attempts at food standards, such as the 16 oz. single-serve soda limit in New York City. However, the goal to reduce

exposure to foods that make people sick is not very different from our approach to water safety, which is to regulate the quantity of contaminants in water that would lead to chronic diseases. (The maximum contaminant level is based upon the amount of water people usually drink.) Food retail operators appear to be exempt from the kinds of regulations to which other businesses must adhere-- to either do no harm or at least warn consumers of the negative consequences.

In theory, public health has the power to implement the kinds of regulations we recommend.[46–48] For example, a couple localities have already limited some marketing strategies of fast food to children (i.e. no free toys).[49] Regulations have been enacted for reducing accessibility and limiting impulse purchases of alcohol and tobacco, and for controlling the exposure to toxins. But just as the tobacco industry fought any restrictions on tobacco sales, we can expect the food industry to resist any regulations that could potentially curtail their current business practices.

Our food industry uses marketing tactics that overwhelm our cognitive capacities and nudge us to overconsume foods that will make us sick. Without easily understood and accessible standards for marketing foods, people find themselves exposed to nutrients in quantities that put them at risk for disease on a daily basis. The advantage of implementing the standards we recommend is that, compared to other industries, full consumer choice can be maintained. The standards simply provide a way for people to avoid overeating, provide opportunities to access healthier meals, while still allowing consumers to purchase as many unhealthy foods as they wish. Point of purchase interventions can also be used in conjunction with other cost-effective approaches for obesity prevention. [50]

The food environment has become a complicated system of marketing tactics that is difficult to navigate. Because most food decisions are made via an unconscious *System 1*, standards are needed to address foreseeable, routine errors in food decision-making. Standards for marketing unhealthy foods at the point of purchase could improve people's diet without limiting choice.

Acknowledgments

This work was supported in part by NHLBI # R21HL114112.

References

1. Kahneman D. A perspective on judgment and choice: mapping bounded rationality. The American psychologist. Sep; 2003 58(9):697–720. [PubMed: 14584987]
2. Bargh, J. Bypassing the Will: Toward Demystifying the Nonconscious Control of Social Behavior. In: Hassin, RR., Uleman, JS., editors. The New Unconscious. New York, NY: Oxford University Press; 2005.
3. Bargh JA. Losing consciousness: Automatic influences on consumer judgment, behavior, and motivation. Journal of Consumer Research. 2002; 29(2):280–285.
4. Thaler, R., Sunstein, C. Nudge. New York: Penguin Group; 2008.
5. Milosavljevic M, Koch C, Rangel A. Consumers can make decisions in as little as a third of a second. Judgment and Decision Making. 2011; 6(6):520–530.
6. Dayan E, Bar-Hillel M. Nudge to nobesity II: Menu positions influence food orders. Judgment and Decision Making. 2011; 6(4):333–342.

7. Chandon P, Hutchinson JW, Bradlow ET, Young SH. Does In-Store Marketing Work? Effects of the Number and Position of Shelf Facings on Brand Attention and Evaluation at the Point of Purchase. Journal of Marketing. 2009; 73(6):1–17.
8. Vohs KD, Baumeister RF, Schmeichel BJ, Twenge JM, Nelson NM, Tice DM. Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. J Pers Soc Psychol. 2008; 94(5):883–898. [PubMed: 18444745]
9. Bryan J, Tiggemann M. The effect of weight-loss dieting on cognitive performance and psychological well-being in overweight women. Appetite. Apr; 2001 36(2):147–156. [PubMed: 11237350]
10. Baumeister RF, Muraven M, Tice DM. Ego depletion: A resource model of volition, self-regulation, and controlled processing. Social Cognition. 2000; 18(2):130–150.
11. Nijs IMT, Muris P, Euser AS, Franken IHA. Differences in attention to food and food intake between overweight/obese and normal-weight females under conditions of hunger and satiety. Appetite. 2009; 54(2):243–254. [PubMed: 19922752]
12. Volkow ND, Wang GJ, Maynard L, et al. Brain dopamine is associated with eating behaviors in humans. Int J Eat Disord. Mar; 2003 33(2):136–142. [PubMed: 12616579]
13. Dan, Ariely. Predictably Irrational, Revised and Expanded Edition: The Hidden Forces That Shape Our Decisions Paperback – April 27, 2010. New York: Harper Collins; 2010.
14. Krebs-Smith SM, Guenther PM, Subar AF, Kirkpatrick SI, Dodd KW. Americans do not meet federal dietary recommendations. J Nutr. Oct; 2010 140(10):1832–1838. [PubMed: 20702750]
15. Wu HW, Sturm R. What's on the menu? A review of the energy and nutritional content of US chain restaurant menus. Public Health Nutr. May 11.2012 :1–10. [PubMed: 23294865]
16. Cohen DA, Farley TA. Eating as an Automatic Behavior. Preventing Chronic Disease. 2008; 5(1) http://www.cdc.gov/pcd/issues/2008/jan/2007_0046.htm.
17. Curhan RC. The relationship between shelf space and unit sales in supermarkets. Journal of Marketing Research. 1972; 9:406–412.
18. Ailawadi KL, Beauchamp JP, Donthu N, Gauri DK, Shankar V. Communication and promotion decisions in retailing: A review and directions for future research. Journal of Retailing. 2009; 85(1):42–55.
19. CSPI. Temptation at Checkout: The power of point-of-sale retail food marketing. 2015
20. Zimmerman FJ. Using marketing muscle to sell fat: the rise of obesity in the modern economy. Annu Rev Public Health. 2011; 32:285–306. [PubMed: 21219166]
21. BBCNews. Tesco to end checkout sweets in 'healthy choice' move. BBC News; 2014. http://www.bbc.com/news/uk-27514077
22. BusinessTech. Woolworths takes sweets and chocolates off checkout shelves. DionWired; 2015. http://businesstech.co.za/news/general/97057/woolworths-takes-sweets-and-chocolates-off-checkout-shelves/
23. Dijksterhuis A, Smith P, van Baaren R, Wigboldus D. The Unconscious Consumer: Effects of Environment on Consumer Behavior. Journal of Consumer Psychology. 2005; 15(3):193–202.
24. Chartrand T. The Role of Conscious Awareness in Consumer Behavior. Journal of Consumer Psychology. 2005; 15(3):203–210.
25. Klein B, Wright JD. The economics of slotting contracts. Jl of Law and Economics. 2007; 50(3): 421–454.
26. IOM. Dietary Reference Intakes Tables and Application. 2015. http://www.iom.edu/Activities/Nutrition/SummaryDRIs/DRI-Tables.aspx
27. Krider RE, Raghubir P, Krishna A. Pizzas: p or square? Psychophysical biases in area comparisons. Marketing Science. 2001; 20(4):405–425.
28. Dallas SK, Liu PJ, Ubel PA. Potential problems with increasing serving sizes on the Nutrition Facts label. Appetite. Dec.2015 95:577–584. [PubMed: 26278876]
29. USDA. PART D: SCIENCE BASE Section 3: Discretionary Calories. 2005. http://www.health.gov/DIETARYGUIDELINES/dga2005/report/HTML/D3_DiscCalories.htm
30. Young LR, Nestle MS. Portion sizes in dietary assessment: issues and policy implications. Nutr Rev. 1995; 53(6):149–158. [PubMed: 7478309]

31. Johnson RK, Appel LJ, Brands M, et al. Dietary sugars intake and cardiovascular health: a scientific statement from the American Heart Association. Circulation. 2009; 120(11):1011–1020. [PubMed: 19704096]
32. Salud. El plato del bien comer. 2014. http://www2.esmas.com/salud/nutricion/084267/el-plato-del-bien-comer/
33. Sharpe KM, Staelin R. Consumption effects of bundling: Consumer perceptions, firm actions, and public policy implications. Journal of Public Policy & Marketing. 2010; 29(2):170–188.
34. Cohen, DA., Bhatia, R., Story, MT., et al. Performance Standards for Restaurants: A New Approach to Addressing the Obesity Epidemic. Santa Monica, CA: 2012. http://www.rand.org/pubs/conf_proceedings/CF313.html
35. Pomeranz JL, Adler S. Defining commercial speech in the context of food marketing. J Law Med Ethics. Mar; 2015 43(Suppl 1):40–43. [PubMed: 25846162]
36. Yauch, J. Check it Out, A Healthy Checkout!. 2011. https://nccd.cdc.gov/DCHSuccessStories/showdoc.aspx?s=730&dt=0
37. Rohr, C., Rubin, J., Winpenny, E., et al. Consumers' responsiveness to alcohol multi-buy sales promotions. 2013. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/344771/report263.pdf
38. Dijksterhuis A, Aarts H. On wildebeests and humans: The preferential detection of negative stimuli. Psychological Science. 2003; 14(1):14–18. [PubMed: 12564748]
39. NationalRestaurantAssn. Healthful, flavorful meals top trends at QSRs, fast casuals. 2012. http://www.restaurant.org/News-Research/News/Healthful,-flavorful-meals-top-trends-at-QSRs,-fas
40. Hyland A, Cummings KM. Restaurateur reports of the economic impact of the New York City Smoke-Free Air Act. Journal of public health management and practice : JPHMP. Jan; 1999 5(1): 37–42.
41. Anzman-Frasca S, Mueller MP, Sliwa S, et al. Changes in children's meal orders following healthy menu modifications at a regional US restaurant chain. Obesity (Silver Spring). May; 2015 23(5): 1055–1062. [PubMed: 25919925]
42. Fry, C., Levitt, Z., Ackerman, A., Laurison, HB. Health on the Shelf: A guide to healthy small retailer certification programs. 2013. http://www.changelabsolutions.org/sites/default/files/Health_on_the_Shelf_FINAL_20130322-web.pdf
43. LICENSING FOR LETTUCE: A Guide to the Model Licensing Ordinance for Healthy Food Retailers. 2013. http://www.changelabsolutions.org/sites/default/files/Licensing_for_Lettuce_FINAL_20130212_0.pdf
44. Shah AK, Shafir E, Mullainathan S. Scarcity frames value. Psychol Sci. Apr; 2015 26(4):402–412. [PubMed: 25676256]
45. Mani A, Mullainathan S, Shafir E, Zhao J. Poverty impedes cognitive function. Science. Aug 30; 2013 341(6149):976–980. [PubMed: 23990553]
46. Brownell KD, Pomeranz JL. The trans-fat ban--food regulation and long-term health. N Engl J Med. May 8; 2014 370(19):1773–1775. [PubMed: 24806156]
47. Pomeranz JL. Advanced policy options to regulate sugar-sweetened beverages to support public health. J Public Health Policy. Feb; 2012 33(1):75–88. [PubMed: 21866177]
48. Pomeranz JL, Brownell KD. Portion sizes and beyond--government's legal authority to regulate food-industry practices. N Engl J Med. Oct 11; 2012 367(15):1383–1385. [PubMed: 22998343]
49. Otten JJ, Hekler EB, Krukowski RA, et al. Food marketing to children through toys: response of restaurants to the first U.S. toy ordinance. Am J Prev Med. Jan; 2012 42(1):56–60. [PubMed: 22176847]
50. Gortmaker SL, Wang YC, Long MW, et al. Three Interventions That Reduce Childhood Obesity Are Projected To Save More Than They Cost To Implement. Health Aff (Millwood). Nov 1; 2015 34(11):1932–1939. [PubMed: 26526252]
51. Kahneman, D. Thinking, Fast and Slow. NY: Farrar, Straus, Giroux; 2011.
52. Wedel, M., Pieters, R., Wedel, M., Pieters, R. Visual marketing: From attention to action. New York, NY: Taylor & Francis Group/Lawrence Erlbaum Associates; 2008. Introduction to visual marketing; p. 1-8.

53. Hofmann W, Vohs KD, Baumeister RF. What people desire, feel conflicted about, and try to resist in everyday life. Psychological Science. 2012; 23(6):582–588. [PubMed: 22547657]

Table 1

System 1 Limits in Moderating Food Intake

- Non-cognitive processing/decision making[51]
- Limited numeracy skills [51]
- Automaticity of eating with multi-tasking capacity [16]
- Lack of control of eyegaze[52]
- Decision fatigue/Limited cognitive capacity[10]
- Dopamine response to novelty and palatable foods[12]
- Limited capacity to follow through on goals[53]
- Limited ability to judge portion sizes [27]
- Inability to estimate calories
- Unconscious learning and response to priming and conditioning[51]

Table 2

How Impulse Marketing Strategies Undermine Rational Choice

Strategy	**Mechanisms that Shift Decisions from Cognitive to Automatic**
Placement in salient and convenient locations	Eyes are automatically drawn to particular points of scene based upon height, color contrasts, motion, etc.
Logos, brands, images	Symbols work through priming or conditioning
Celebrity endorsements	Classical conditioning
Pricing/promotions	Appeals to value, financial savings, particularly effective for those with limited resources
Create feeling of urgency	Disruptive messages, including a clear call to action at point of sale.
Framing and comparisons	Shifts reference scales to change evaluations
Large variety and multiple choices	Overwhelms cognitive capacity
Multiple product claims	Overwhelms cognitive capacity

Table 3

Proposed Point of Purchase Interventions

		Effect on Consumers	Effect on Food Industry
Standardized portion sizing	Would establish the reasonable quantity for a single serving that would not put people at risk for a chronic disease.	Assist in consuming normal portion sizes.	If industry-wide, could increase profits.
Meal Standards	Would establish guidelines for meals that could be eaten 3x/day and not place consumers at risk of a chronic disease (Each meal contain approximately 1/3 of essential RDAs)	More easily allow consumption of meals that contribute to a healthy diet.	Would require reformulation of some meals. Restaurants that adopt these could attract customers interested in healthy eating.
Reductions of Impulse Marketing	Would limit impulse marketing of foods associated with chronic diseases; Would reduce promotions, including discounts for impulse items.	Help consumers avoid purchasing items they did not intend on purchasing. Would likely save consumers money.	Likely decrease in profits for some items, but could be offset by increase in healthy impulse purchases.
Warning Labels	Would identify products with discretionary calories as well as the serving size that would exceed the daily Tolerable Upper Intake Level for children and adults or Acceptable Macronutrient Distribution Range	Provide consumers more clear information about harmful foods.	Companies with a larger product mix of unhealthy foods would likely have reduced profits, with the opposite for companies that offer healthy foods.