



*Behavioral Economics and the Psychology  
of Fruit and Vegetable Consumption:*

## *A Scientific Overview, 2012*



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## ABSTRACT

Drawing from principles associated with behavior economics and psychology, a new consumer behavior theory is becoming more widely accepted across the social sciences. The new theory draws on scientific evidence showing that systematic biases in consumers' beliefs, preferences, and decision processes underlie many societal problems, including poor dietary habits. Leveraging this new theory, research has shown that the use of certain marketing displays, tools, incentives, and promotions can make it easier for consumers to make fruit and vegetable consumption decisions that support long-term health. In this scientific overview, we outline tools that encourage the purchase and intake of more fruit and vegetables. As this literature review shows, there is evidence that the following tools can or may be effective:

### *Display and Setting Tools*

#### **1. MAKE FRUIT AND VEGETABLES THE DEFAULT**

Creating a default option has been a powerful tool in savings and retirement studies and there have been a few studies in food domains.

#### **2. INCREASE THE PROMINENCE OF FRUIT AND VEGETABLES**

There are many opportunities to make fruit and vegetables more visible and prominent in cafeterias, grocery stores, and homes.

#### **3. INCREASE FRUIT AND VEGETABLE VARIETY**

At school and at home, kids will eat more fruit and vegetables when there are more options to choose from.

#### **4. DECREASE NON-FRUIT AND VEGETABLE ALTERNATIVES**

Fruit and vegetables compete with less healthy options in homes and cafeterias. By restricting access to these alternative choices, fruit and vegetable consumption will increase.

#### **5. INCREASE THE CONVENIENCE OF FRUIT AND VEGETABLES**

Single servings of fruit and vegetables have increased in availability, but there is probably still latent demand.

#### **6. PROVIDE TIMELY REMINDERS**

Timely reminders can increase fruit and vegetable consumption in restaurants and cafeterias.

### *Incentive and Price Tools*

#### **7. OFFER STRATEGIC DISCOUNTS**

Short-term discounts can lead to long-term increases in purchases.

#### **8. CONSIDER PRICE PERCEPTION AND FAIRNESS**

"Pennies-a-day" price frames lead to a greater perception of value.

#### **9. OFFER BONUS QUANTITIES**

For virtue products like fruit and vegetables, consumers may prefer bonus packs rather than discounts.

#### **10. USE SMALL MONETARY INCENTIVES**

Small monetary incentives for children increase fruit and vegetable consumption during school lunch.

#### **11. USE SOCIAL REWARD**

Praise for eating vegetables increases consumption among small children.

## *Planning and Habit Tools*

### **12. CREATE PRE-COMMITMENT TOOLS**

People eat healthier when they pre-commit to meals, and more tools are providing opportunities to do so.

### **13. CREATE SIMPLE TRACKING TOOLS**

Most tracking tools are too complex for sustained use. Simple tracking tools help people achieve goals.

### **14. CREATE PERSONAL STRATEGIES**

Many people aspire to eat more fruit and vegetables, and marketers can support these efforts.

### **15. PROMOTE HABIT-STARTING OPPORTUNITIES**

Habits are more likely to form when other changes are occurring in a person's life, or when they can be easily latched onto a current behavior.

### **16. ENCOURAGE ONLY FRUIT & VEGETABLE SNACKING WHILE WATCHING TV**

Families can establish rules that the only snacks that they can eat while watching television are healthy options such as fruit and vegetables.

### **17. FACILITATE PREFERENCE CHANGE**

Children acquire a preference for fruit and vegetables after repeatedly trying these items.

## *Messaging Tools*

### **18. USE APPROPRIATE NUTRITION LABELING**

Many third-party labeling systems are being introduced in supermarkets.

### **19. PROMOTE NATURALNESS**

"Natural" is a very appealing category for consumers and fruit and vegetables should own this category.

### **20. HIGHLIGHT SOCIAL NORMS**

Associations with in-groups can greatly influence consumption.

### **21. LEVERAGE LOSS AVERSION**

Messages highlighting lost opportunities for nutrition may be very powerful.

### **22. USE STRONG, APPEALING BRANDING**

Branding is challenging but powerful when it works.

Each of these tools provide suggestions and opportunities to improve America's long-term health by increasing the consumption of fruit and vegetables. Taken together, these tools represent an approach for key stakeholders—from marketers, schools, parents, policymakers, and researchers—to manage and market fruit and vegetable offerings in ways that make it easier for consumers to make healthier eating choices.

Based on the findings in this review, PBH has compiled a separate resource guide of actionable strategies, tools, and resources for each set of stakeholders, providing specific ideas designed to help consumers make healthier consumption decisions that include more fruit and vegetables. The Researcher Resource Guide also poses questions and ideas for further research to evaluate the effectiveness of the tools outlined in this review.

#### **TO ACCESS THE RESOURCE GUIDES:**

Click here for the *Marketer Resource Guide* or go to **PBHFoundation.org** and click on *Private Sector*.

[http://www.pbhfoundation.org/pdfs/pri\\_sec/StrategiesToolsResources\\_Marketers.pdf](http://www.pbhfoundation.org/pdfs/pri_sec/StrategiesToolsResources_Marketers.pdf)

Click here for the *School Resource Guide* or go to **PBHFoundation.org** and click on *Private Sector*.

[http://www.pbhfoundation.org/pdfs/pub\\_sec/StrategiesToolsResources\\_Schools.pdf](http://www.pbhfoundation.org/pdfs/pub_sec/StrategiesToolsResources_Schools.pdf)

Click here for the *PolicyMaker Resource Guide* or go to **PBHFoundation.org** and click on *Private Sector*.

[http://www.pbhfoundation.org/pdfs/about/policy/StrategiesToolsResources\\_PolicyMakers.pdf](http://www.pbhfoundation.org/pdfs/about/policy/StrategiesToolsResources_PolicyMakers.pdf)

Click here for the *Researcher Resource Guide* or go to **PBHFoundation.org** and click on *Private Sector*.

[http://www.pbhfoundation.org/pdfs/about/res/Questions\\_SuggestedFollowUp\\_Researchers.pdf](http://www.pbhfoundation.org/pdfs/about/res/Questions_SuggestedFollowUp_Researchers.pdf)

Click here for the *Parent Resource Guide* or go to **FruitsAndVeggiesMoreMatters.org** and then go to the kids page.

[http://www.fruitsandveggiesmorematters.org/wp-content/uploads/UserFiles/File/pdf/resources/kids/StrategiesToolsResources\\_Parents.pdf](http://www.fruitsandveggiesmorematters.org/wp-content/uploads/UserFiles/File/pdf/resources/kids/StrategiesToolsResources_Parents.pdf)

## *Behavioral Economics and the Psychology of Fruit and Vegetable Consumption:*

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### INTRODUCTION

Historically, regulatory and marketing policies in many domains (including health, agriculture, and finance) have been devised using the assumptions of classical economics, whereby consumers make optimal use of available information and make choices and tradeoffs in a manner that optimizes their well-being. While it has long been recognized that these assumptions were not quite right, only in the last 15 years have economists taken seriously the possibility that there are many cases when these assumptions are substantially off the mark. Many now argue that more realistic assumptions must be made in order to make accurate forecasts, devise effective policies, and execute effective marketing campaigns (Orszag, 2008). These new assumptions are particularly appealing in combating some very common cases of seemingly self-destructive human behavior, including addiction, failure to save for retirement, and poor dietary habits.

In this report, we begin by briefly reviewing the nature of this new model of consumer behavior, offering several examples in the process. We then use behavioral economics principles to outline a toolkit specific to the marketing and regulation of fruit and vegetables. Some of the “tools” have already been studied in the fruit and vegetable context, and we will review relevant details of those studies. Other tools have not been studied in this context and in these cases we will review evidence justifying their exploration.

This toolkit is applicable to many kinds of consumers (e.g., children, employees, retail customers, and low-income individuals) in many contexts (e.g., home, school cafeterias, restaurants, and supermarkets), and can be applied by many kinds of marketers (e.g., producers, retailers, parents, and governments). Whenever it is not obvious, we will specify the consumers, contexts, and marketers for which specific tools will be most useful.

It is our hope that an understanding of this new model of consumer behavior will help marketers better understand consumer needs, and better understand why their customers may benefit from some changes in marketing practice. It is also our hope that this toolkit will suggest new opportunities for research into marketing practices that can increase fruit and vegetable consumption in a variety of contexts.



## BEHAVIORAL ECONOMICS AND PSYCHOLOGY

### *Automatic and Reflective Systems*

Many economists now accept a widely held psychological theory of the human mind which characterizes two separate but interacting systems—an automatic system and a reflective system (Kahneman 2003, 2011). The automatic system makes decisions that are fast, effortless, uncontrolled, emotional, and often unconscious. By contrast, the reflective system makes decisions that are slow, effortful, controlled, deductive, and generally involve self-awareness. The automatic system is at play when we speak our native language. The reflective system is at play when we try to learn a foreign language (Dolan 2010).

In his book, *Mindless Eating*, Brian Wansink (2006) suggests that the automatic system guides most of our food decisions. An example comes from his “bottomless soup bowl” research. In this study, people came into a laboratory kitchen and were seated at a table with a large bowl of soup. They were told to eat as much soup as they wanted. For half of the participants, a hole had been drilled in the bottom of the soup bowl, and a tube was attached, allowing soup to be gradually pumped into the bowl as the person continued to eat. People with these “bottomless” bowls ate about 75% more soup than people with normal bowls. Importantly, despite the large difference in the amount of soup consumed, both groups felt equally full afterwards. Wansink argues that we use subtle visual cues to decide when we have eaten enough and that

we generally do not actively keep track of how much we are eating, because doing so would be a major cognitive burden. Usually we are on auto-pilot with respect to our eating, and our reflective system is reserved for conversation with our eating companions (or for the television).

Another often-seen behavior of the automatic system is the preference for default options. If people are actively choosing and carefully reflecting on all of their decisions, then they should not be heavily influenced by whether or not a particular option happens to be the default, especially for important decisions. But we are heavily influenced by defaults. For example, Johnson and Goldstein (2003, 2004) showed that organ donation rates are above 90% in countries such as Sweden where people must opt out of donating (by ticking a box on their drivers’ licenses if they do not wish to donate their organs upon death), but donation rates are below 10% in countries like Denmark where people have to opt in (by ticking a box if they do wish to donate). This insight from organ donation decisions has been successfully used in a financial context to increase rates of retirement savings. For example, Choi et al. (2003) found higher rates of participation in a workplace savings plan when employees were enrolled unless they opted out, as opposed to a more traditional plan where employees were



not enrolled unless they opted in. Even for important decisions like organ donation and retirement savings, decisions are often governed by our automatic systems, so we are more likely to passively accept a default, rather than actively choose an alternative. In this overview, we will review applications of this insight in the context of fruit and vegetable consumption.

Not all of our decisions are automatic, of course. In the food context, the reflective system is at play when we do things like counting calories, a strategy that is effective for some dieters (at least initially). Another more general example of the reflective mind at work is seen in decisions to pre-commit to more sensible choices. When given the opportunity to do so, people often make choices that commit them to better actions in the future, because they know that they have limited self-control. For example, Ariely and Wertenbroch (2001) found that college students willingly accepted mid-semester deadlines for course assignments (with penalties for missing them), knowing that without these deadlines they would leave too much work until the last minute and find themselves cramming at the end of the semester. In a retirement savings study, Thaler and Benartzi (2004) devised a “save-more-tomorrow” scheme, whereby employees had the option of having their retirement deductions automatically increase over time. The scheme was very popular, as employees preferred to pre-commit to saving their future salary raises, rather than preserving the option to spend more money when a raise eventually came.

### *Non-Standard Beliefs, Preferences, and Decision Making*

Della Vigna (2009) has usefully characterized the departures from the standard (or strictly rational) consumer model into three categories: Non-standard beliefs, non-standard preferences, and non-standard decision making. Here we will discuss some of the most celebrated illustrations of each of these; most are outside the context of fruit and vegetable consumption. In the toolkit section we specify how these and other non-standard elements of consumer behavior can be addressed to promote increased consumption of fruit and vegetables.

#### **NON-STANDARD BELIEFS**

To say that people hold some non-standard beliefs is to say that they do not form opinions that are appropriate in either direction or strength, given the evidence that is available to them. An example of the direction of our beliefs is what psychologists call projection bias. When people make predictions about what their own preferences will be like in the future, those predictions tend to be heavily influenced by their current circumstances. In one demonstration, Read and van Leeuwen (1998) asked office workers to choose between a healthy and an unhealthy snack to be delivered a week later, in the late afternoon. The choice they made depended on when they were asked. Some people were asked late in the afternoon (when they were probably a bit hungry) and others were asked right after lunch (when they were probably satiated). When asked to predict their late-afternoon snack preference for the following week, 78% of those who were making the selection in the late afternoon chose the unhealthy snack. But only 42% of those who chose right after lunch selected the unhealthy snack—presumably, many in this latter group incorrectly believed that they would not crave the unhealthy snack quite so badly in late afternoon.

**When asked to predict their late afternoon snack preference for the following week, 78% of those who were making the selection in the late afternoon chose the unhealthy snack. But only 42% of those who chose right after lunch selected the unhealthy snack . . .**

A related phenomenon is that we tend to project our own preferences onto others (Hoch 1987). For example, when asked to estimate how many people drink coffee, coffee drinkers estimate that 60% of adults drink coffee on a daily basis, while non-coffee drinkers estimate that it's only 40%. Our beliefs about what other people do are biased by what we ourselves do.

Another non-standard feature of our beliefs is that we tend to be overconfident, that is, we hold our beliefs with more certainty than we should. For example, when predicting future events, like whether or not a particular stock will close up or down in the next month, even if we are somewhat uncertain, we tend not to be uncertain enough. This over-certainty or overconfidence has been shown in the beliefs of physicians (Bauman, Deber, and Thompson 1991; Berner and Graber 2008; Grove et al. 2000); entrepreneurs (Camerer and Lovallo 1999); managers (Simon and Houghton 2003); marketers (Mahajan 1992); and lay people (Moore and Healy 2008).

#### **NON-STANDARD PREFERENCES**

The main feature of our non-standard preferences was alluded to earlier—people have problems with self-control, and our preference for immediate gratification is often too strong. A good illustration of this tendency comes from a field experiment with real credit card offers (Ausubel 1999). A credit card company mailed offers that varied in both their teaser rate (a relatively low rate offered on purchases during the first six months) and in their regular rate (a much higher rate for purchases after six months). People were much more sensitive to the teaser rate, despite the fact they would be locked in at a higher rate, after 6 months, until the end of their first 2 years of card ownership. In other words, people chose the card that had the biggest short-term payoff

(discount), greatly downplaying the advantage of the longer-term payoff (discount).

There have been many other demonstrations of this strong preference for immediate gratification. Economists sometimes call this hyperbolic discounting (Della Vigna 2004; O'Donoghue & Rabin 1999; Laibson 2004). There is even evidence that present and future rewards are processed in different brain regions (McClure et al. 2004).

This finding presents a particular challenge for fruit and vegetable marketers. The main competition for fruit and vegetables is the packaged foods category which was quite literally designed for immediate gratification (Kessler 2008), both in terms of taste and convenience. The tastes of fruit and vegetables are generally more subtle, and though often chosen for their immediate taste benefits, they are often chosen (and marketed) for their long-term health benefits. Many fruit and vegetables often need some amount of preparation—cooking, cutting, or at least cleaning. The time needed to prepare fruit and vegetables is a significant impediment to a person who places great value on immediate gratification.





A number of strategies in our toolkit address this temporal disadvantage for fruit and vegetables. One notable example, described in more detail later, is the work by Price and Just (2011), where immediate gratification is added to the consumption experience of school children—they are paid money to eat their vegetables.

#### **NON-STANDARD DECISION MAKING**

Evidence for non-standard decision making occurs, for example, in cases where people are thought to use suboptimal heuristics to simplify their choices. One illustration is the suboptimal variety-seeking observed by Simonson (1990). Students were offered snacks to be eaten at each of the next 3 class meetings (each student chose 3 snacks). One group of students was instructed to choose all 3 snacks (at once) in advance. Sixty-four percent of these students chose 3 different snacks. Another group of students made each choice separately, just before each meeting. Only 9% of these students chose 3 different snacks. This suggests that the first group chose too much variety. Other studies from the financial investment domain (Benartzi & Thaler 2001) have shown the same thing. People often choose variety just for the sake of it, and they choose more variety than they will actually enjoy.

Another example of non-standard decision making is susceptibility to various forms of persuasion. Social persuasion has been studied for a long time by social psychologists, going back to the famous Milgram (1963) studies when subjects, under instruction from an experimenter, applied what they believed were powerful electric shocks to individuals who they believed were participating in a laboratory study. Such cases of powerful persuasion can be considered non-standard or irrational because people are influenced to do things that they later regret, or that upon reflection, they realize they would not have done without strong social pressure.

Another useful example comes from a field experiment in a hotel, where subtle signage differences had significant effects on the percentage of guests who re-used towels. When the sign in the bathroom read, “A majority of past guests in the hotel have re-used their towels,” there was a 25% bump in the number of guests electing to re-use their towels, compared to a simple sign mentioning only the environmental benefits. A further bump was achieved when the sign in the bathroom read, “A majority of past guests in this room have re-used their towels.” When people believe that others like them are doing something positive, they are more likely to do it themselves.

Finally, it is clear that people usually make decisions by appealing to feelings and intuitions, rather than by making quantitative assessments of probabilities and valuations. Traditional economic models assumed that informal thought processes would generally produce the same decisions as more formal processes. The non-standard model suggests otherwise. This finding is perhaps most clearly seen in cases of risk assessment—a dramatic example is the case of personal travel, when many people prefer to drive rather than fly, even when they know that flying (on commercial airlines) is objectively safer, because driving just “feels” safer. Another finding related to the prominence of feelings is that people react more strongly to a tragedy when there is a single identifiable victim (as in the widely reported case of “Baby Jessica” who fell into a well in Texas in 1987), than when there are much larger numbers of unidentified victims facing a large-scale tragedy such as genocide or poverty (Small, Loewenstein, and Slovic 2007).

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## THE TOOLKIT

Most of the examples in this toolkit will leverage some form of the “non-standard” or “irrational” beliefs, preferences, and decision making outlined by Della Vigna (2009). Others may be consistent with the standard model (at least under some interpretations), but nonetheless have a strong psychological element and are certainly relevant to the marketing of fruit and vegetables. Some tools will be new; others will just seem like common sense. The purpose here is to provide a useful organization of these tools with the background context of a new model of human behavior that is becoming more widely accepted by social scientists.

Readers who are interested in a longer (and quite technical) review of behavioral economics should see Della Vigna (2009). A general audience treatment of behavioral economics is provided by Thaler and Sunstein (2008). Many of the examples in this toolkit come from food-related reviews by Just et al. (2007) and by Chandon and Wansink (2011).

### *Display and Setting Tools*

#### **1. MAKE FRUIT AND VEGETABLES THE DEFAULT**

The creation of appropriate defaults has been one of the most successful applications of behavioral economics to date. In addition to the examples shown earlier relating to organ donation (Johnson and Goldstein 2003) and retirement savings (Bernartzi & Thaler, 2007), default options have also been used to influence the selection of better insurance plans (Kahneman, Knetsch, and Thaler 1991), vaccination rates (Chapman et al. 2010), and college attendance (Bettinger et al. 2010). Can this approach work to increase fruit and vegetable consumption?

Just and Price (2011) note that successful applications of default options are often binary decisions that are unfamiliar, infrequently-made, and require no subsequent initiative. This pattern is in stark contrast to food choices, where individuals have

many options, make repeated decisions throughout each day, and must play an active role in the decision. In their field experiments, Just and Price find that implementing a default option as a stand-alone policy is a costly way to produce only modest changes in the amount of fruit and vegetables that children eat at school. However, combining a default option with another intervention, such as a small rewards program (see tool number 10), can enhance the effectiveness of both approaches.

There is, however, some evidence that defaults can work in fast food settings. In 2006, the Disney Corporation decided to have apples served as the default in all kids’ meals instead of French fries. Disney reports that the



“overwhelming majority of families” accept the default option rather than choosing an alternative. It is worth noting, however, that a meal at Disney is not a routine meal. To our knowledge, a default approach has not been studied at a large institutional cafeteria. In cafeterias, fruit and vegetables could be automatically added as a side dish to meals, with customers (students) having to request an alternative. Similarly, Just et al. (2007) have suggested that food stamp programs could be changed so that the default allocation includes a large proportion of fruit and vegetables and other healthy foods—this would preserve the individual’s right to choose for themselves, although they would have to actively request an alternative allocation.

Changing defaults probably does provide a good opportunity for increasing fruit and vegetable selection for almost any consumer group, in almost any context. The worry is that marketers may be reluctant to adopt this approach because it can be expensive, and wastage rates may increase since some people who automatically take the default may not eat it. This possibility will be important to quantify in future studies.

It is also worth noting that defaults can operate on two channels of behavior. First, the choice of a default option can communicate social norms about expected behaviors. Second, the default option takes advantage of behavioral inertia and the degree to which individuals neglect to make active choices (due to laziness or inattention), even when they stand to benefit greatly from certain choices. It has been difficult to tease these findings apart. In attempting to do so, researchers may be able to determine which kinds of defaults are likely to be most effective (Carroll et al. 2009; Johnson, Bellman, & Lohse 2002).

## 2. INCREASE THE PROMINENCE OF FRUIT AND VEGETABLES

Because people make so many choices with minimal thought or effort, making fruit and vegetables prominent at the point of purchase is one of the most important strategies for increasing their consumption. The effectiveness of this marketing strategy for increasing purchases explains why manufacturers pay so much in slotting fees at supermarkets.

In one experiment, Wansink, Painter, and Lee (2005) examined the effects of two elements of prominence—proximity and visibility. Candy jars were placed about 6 feet away from the desks of various office employees. The jars were either opaque or transparent. Both factors significantly influenced the number of candies eaten. When the jar was on the employee’s desk (as opposed to being 2 meters away), the employees ate 1.8 additional candies per day. When the candy jar was transparent (as opposed to opaque), employees ate 2.2 more candies per day. Proximity and visibility will be harder to manipulate for perishables like fruit and vegetables, but marketers should look for opportunities to do so.

In a much larger study at a hospital cafeteria, Thorndike et al. (2011) increased sales of bottled water by 30% simply by placing bottles of water in baskets beside each food station in the cafeteria. These additional displays did not involve refrigeration, so this idea may not work for juice, but it certainly could work for easy-to-grab fruit such as apples or bananas. Brian Wansink (2011) has reported success at increasing fruit selection at a school cafeteria by creating a prominent, well-lit, attractive display, although large-scale trials have not yet been reported.

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Several approaches could easily increase the prominence of fruit and vegetables in both stores and homes. For example, stores could place more fruit and vegetables at the check-out counter instead of a candy display. Similarly, parents could place fruit in an attractive and transparent bowl on the kitchen counter or place cut-up vegetables in the fridge so that family members will see these items first when they go looking for a snack.

Prominence may also work through menu placement. In a small study at a Subway restaurant, Downs et al. (2009) increased consumption of healthy sandwiches by placing them prominently on the menu. To our knowledge, large-scale trials with fruit and vegetables have not been done, but it would be easy to give entrées with more vegetables a more prominent place on the menu or to place fruit and vegetables first on the list of side dishes.

### 3. INCREASE FRUIT AND VEGETABLE OPTIONS

Several studies have shown that people consume more food overall when they have more options to choose from, especially if they are allowed to choose more than one item. In a lab experiment by Bucher et al. (2011), student participants chose a larger quantity of vegetables when offered two choices of vegetables instead of one, suggesting that offering an increased variety of vegetables may result in higher rates of consumption. On average, participants selected from 37 to 57 more calories from vegetables when there were two vegetable items to choose from. Similarly, Rolls et al. (1981) found that when people were offered 3 yogurt flavors as opposed to one, yogurt consumption increased by 19 percent.

Just, Lund, and Price (2011) used data based on consumption patterns during school lunch at elementary schools to examine the effect of variety on the amount of fruit and vegetables that children eat. They reviewed data from 22 elementary schools and over 48,000 child-day observations. They found that each additional fruit or vegetable item offered increased the number of children who ate at least one serving of fruit and vegetables by 12%. In these schools the number of items being offered generally varied from 1-4 items. The increased use of salad bars in school cafeterias (part of Michele Obama's "Let's Move Salad Bars to Schools" initiative) provides an opportunity to dramatically increase the variety of fruit and vegetables that children have access to during lunch. Similar efforts could provide children access to a fruit bar as part of the school breakfast program.

Interestingly, Wansink (2010) suggests that variety constraint is the primary reason for the positive effects of the Atkins Diet. Although the Atkins Diet does not put limits on the total amount of food that individuals consume, it greatly limits the variety of foods that a person can eat. Wansink suggests that the reduced variety leads to reduced total consumption, which leads to weight loss.

There is some evidence that variety can backfire if people can only choose one option. In one famous study (Iyengar 2000), supermarket customers were more likely to purchase a jar of jam if they only had 6 flavors to choose from rather than 24. It seems that choosing between 24 items was too difficult, or required too much time, so consumers skipped the jam altogether. We suspect, however, that this is an extreme case. There probably is such a thing as too much variety (especially when consumers are rushed), but if displays are well organized, customers will probably easily navigate through the different options. And since consumers usually can choose more than one item, variety will rarely be intimidating.

#### 4. DECREASE NON-FRUIT AND VEGETABLE ALTERNATIVES

One approach to increasing fruit and vegetable consumption is reducing the alternative options that individuals face when making food choices. In a school setting, these competing options include snack bars, vending machines, and a la carte items (Haskins, Paxson, and Donahue 2006; Story, Nanny, and Schwartz 2009). For example, Kubik et al. (2003) find that the availability of a la carte items is inversely related to fruit and vegetable consumption at school.

Theoretical work in economics highlights the fact that individuals may prefer a situation in which they have fewer choices as a way of protecting themselves from the temptation of making unhealthy choices (Stovall 2010). As such, restaurants or grocers that offer fewer (but healthier) items might attract more customers who want to avoid the temptation of a large set of unhealthy items. This model also provides justification for policies that restrict the types of foods that are available to children at school, such as removing vending machines that offer unhealthy items or restricting how often French fries can be served.

Similar models by Gul and Pesendorfer (2001) and Dekel, Lipman, and Rustichini (2009) highlight the fact that the availability of certain future choices can also influence current choices. In other words, the availability of dessert may negatively impact the choice of picking a salad or a pizza. If a person knows they have the option of picking dessert, they might decide to exercise no self-control and choose the less healthy option for both decisions, rather than exercising self-control over just one of the decisions. This model suggests that eliminating certain types of non-healthy choices from the school menu can encourage healthier choices for all aspects of the meal.

#### 5. INCREASE CONVENIENCE OF FRUIT AND VEGETABLES

It is obvious that if foods are not conveniently available, people will not eat them. This tendency has been most dramatically shown in the work on food deserts. For example, Cullen et al. (2003) found that parents' and children's reported access to fruit, juice, and vegetables were significant predictors of the children's consumption of these foods. But there are more subtle ways in which convenience can impact fruit and vegetable consumption.

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Wansink (2011) has noted that in cafeteria settings where individuals do not use a tray they are much less likely to eat vegetables as part of their meal. Since vegetables are often eaten as a side dish, if people can only carry one plate, they are more likely to forgo vegetables. If they have a tray, however, they are more likely to take a side dish. Also in cafeteria settings, reducing travel times can help. Convenience may be another reason why the Thorndike (2011) study reported increased water sales in a hospital cafeteria. The prominent location of the water right next to the cash register made the choice more salient, but having it placed beside the food station also saved customers a separate trip to the beverage refrigerator. In a crowded cafeteria, this placement can be useful, especially if visiting the refrigerator requires putting your tray down again.



Making single-serve packages available is another important convenience opportunity. Just et al. (2007) suggest that there should be more single-serve opportunities for whole grain cereals and low-fat cheese (similar to the widely available 100-calorie snack packs for less healthy foods). When it comes to fruit and vegetables, we notice a lack of single-serve packages of salads in supermarkets. Presumably, most packagers have not yet found these to be cost effective, but the opportunity does seem striking. With frozen vegetables, several product lines have been successful with single servings. Single-serve fruit cups are becoming more widely available. On the other hand, frozen fruit, often promoted by nutritionists as a great snack item, is not widely sold in single servings. If a single serving of frozen raspberries or strawberries could be packaged, it might be feasible to serve them in cafeterias, and they might become popular for home use as well.

#### **6. PROVIDE TIMELY REMINDERS**

McDonalds earned a good deal of unfavorable press for its “supersize” initiative in the early 2000s and the initiative was eventually dropped. But asking every customer if they would like to supersize their portions was a very effective way to influence customer behavior. In a recent study, Schwartz et al. (2011) tried the same approach but with a different objective. They wanted to see if customers would agree

to downsize their portions. At a cooperating fast food restaurant, on certain days, all customers were asked if they would like to save 200 calories by taking a half portion of their side dish. Sometimes a 25-cent discount was offered, sometimes it wasn't; this pricing difference turned out not to matter. Regardless of the nominal discount, about one-third of customers accepted the smaller portion. The authors concluded that many people are interested in opportunities to eat a little better, but they need to be reminded at the right time. Only rarely would customers spontaneously ask for smaller portions. But they willingly accepted them when offered. The underlying psychology is similar to that observed in the deadline study described earlier. Students voluntarily accepted optional deadlines on course assignments (to help keep them on track), but they almost never spontaneously asked for them.

To promote healthy eating, restaurant chains may consider promotions in which customers are asked if they would like additional small veggie sides or fruit desserts. If these can be offered at a relatively low price, as a sort of utility item, people may be quite open to accepting them. Apparently McDonalds is now doing something like this by asking every customer (after their order is placed) if they would also like a bottle of water. Perhaps they could try this approach, using fruit as a default. Or perhaps fruit and vegetables could be offered, not as an additional item, but as a partial replacement. If customers order ice cream for dessert, they could be asked if they would prefer half ice cream and half fruit instead. This kind of program would be a “volume play.” It should be noted that it takes effort for retailers to have their servers consistently make specific offers, and there is some risk that eventually consumers could get annoyed. Costs and prices would have to be kept as low as possible to incentivize compliance, but this strategy might be economically feasible since the volume gains could be considerable. The Fruits & Veggies—More Matters® logo could serve as a timely reminder, but the message would probably be more effective if presented by a store clerk rather than through signage. Retailers could experiment with simple, personal selling efforts in the produce section or in the frozen food aisle where clerks hand out Fruits & Veggies—More Matters brochures.

### *Incentive and Price Tools*

Pricing fruit and vegetables is a challenge because value additions (like washing and cutting) and price reductions due to seasonality are not always perceived or understood by customers (and perhaps even by retailers). At the same time, price is a primary consideration in most consumer purchases, a fact that is widely known by economists, marketers, and policymakers alike. There are still, however, a few opportunities related to pricing that are based on insights from behavioral economics.

#### **7. OFFER STRATEGIC DISCOUNTS**

Discounts can provide incentives to increase fruit and vegetable consumption. Jefferey et al. (1994) found that sales of fruit and salad increased threefold during a 3-week, 50% price-reduction period at a worksite cafeteria and returned to baseline levels when original prices were reinstated. In a school-based study to promote consumption of fruit and vegetables among students conducted by French et al. (2004), a short-term intervention that lowered prices or increased availability had a positive effect on fruit and vegetable consumption.

What is less clear is whether or not the cost of providing discounts will be made up through additional demand once the discount is removed. In a recent study in New Zealand, Mhurchu et al. (2010) conducted a 6-month intervention in which supermarket customers were randomly selected to receive either price discounts on food products, tailored nutrition education materials, or both. Supermarket customers who received price discounts purchased more fruit and vegetables over the intervention period, and much of this increase in consumption was still present 6 months later.

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**Supermarket customers who purchased high-calorie versions of products were given discount coupons at the register that offered them 40% off low-calorie versions of the products they purchased. In a follow-up survey, 76% of those who received the coupons reported they were more likely to purchase the low-calorie product again.**

Recent marketing campaigns such as Catalina Marketing's Simple Substitutes support the idea that price discounts can promote consumption of fruit and vegetables. Supermarket customers who purchased high-calorie versions of products were given discount coupons at the register that offered them 40% off low-calorie versions of the products they purchased. In a follow-up survey, 76% of those who received the coupons reported they were more likely to purchase the low-calorie product again. Discounts to specific customers, recommending specific substitutions, are more expensive to deliver, but they do provide the opportunity to experiment and identify the best opportunities for longer-term behavior change. To our knowledge there have been no large-scale field experiments addressing this possibility.

#### **8. CONSIDER PRICE PERCEPTION AND FAIRNESS**

According to the USDA Economic Research Service (2011), an adult eating 2000-calories a day can fulfill the recommended intake of fruit and vegetables at a cost of \$2-\$2.50 per day. A study by Gourville (1999) suggests that this kind of "pennies-a-day" price framing is much more effective in increasing value perception than alternatives like \$15 per week or \$800 per year. Produce for Better Health Foundation (PBH) has a tip sheet showing consumers how that \$2-\$2.50 can be made up by doing things like eating a meatless meal (save \$3.50), drinking water instead of soda at a restaurant (save \$2.00), or packing a lunch vs. eating out (save \$5.00). These kinds of tips can highlight the pennies-a-day price framing that increases value perception, providing consumers with concrete ways of making health-conscious tradeoffs. Experiments researching the value of these kinds of tradeoffs in retail environments would be of great interest. Retailers need not suggest tradeoffs for other items in the store, but can offer tradeoffs against eating out or against non-food products like entertainment purchases.

#### **9. OFFER BONUS QUANTITIES**

A recent study (Mishra and Mishra 2011) compared two promotion strategies (price discounts vs. bonus packs) on two kinds of products (vice goods vs. virtue goods). Vice goods are indulgences (e.g., junk food, cigarettes) while virtue goods are products that people would like to consume more of (e.g., fruit and vegetables). The authors find that consumers prefer price discounts for vice goods, so that they can mitigate the guilt of the purchase—about 66% prefer the discount to the bonus pack. However, the same study showed 62% of consumers prefer bonus packs for virtue goods—in these cases, a discount is not guilt mitigating, so greater pleasure from getting a good deal is provided if the quantity is increased. These findings came from a small laboratory study, so larger field experiments (in supermarkets) should be attempted.

#### **10. USE SMALL MONETARY INCENTIVES**

There is a growing body of research that examines the impact of financial incentives in a variety of settings. Incentives influence behavior by turning the intangible benefits of behaviors that influence long-run outcome into tangible rewards. Incentives also help to counter the myopic preferences and impatience that causes individuals to forgo long-term benefits in exchange for immediate rewards.



There have been a few experimental trials that document the powerful role that incentives can play in encouraging children to eat fruit and vegetables. These programs vary in both the nature and timing of the incentives that are provided and in the other types of interventions that are used in conjunction with the incentive program.

One successful incentive-based intervention is the Food Dudes program. This program was developed in Britain and is currently being used by all of the schools in Wales. It combines a small rewards program with a set of peer modeling videos that depict super heroes who enjoy eating fruit and vegetables with short video clips of pop-stars who reinforce this message. There are a number of academic studies that examine the effects of this program (Horne et al. 2009, Greenhalgh et al. 2009; Lowe et al. 2004; Horne et al. 2004). These studies show that the Food Dudes program has a significant effect on the amount of fruit and vegetables that children eat at school and also produces a noticeable effect on children's consumption of fruit and vegetables at home, even after the end of the program. These effects are greatest among the children who had the lowest levels of fruit and vegetable consumption prior to the start of the program. There is a pilot study currently underway in Utah that examines the impact of the Food Dudes program in a U.S. setting (Madden and Wengreen 2011).

Another successful incentive program was designed by Just and Price (2011) who conducted a randomized field experiment that provided small rewards to children who eat at least one serving of fruit and vegetables as part of their school-provided lunch. They found that their small rewards program increased the number of children eating fruit and vegetables by 80%. This increase was even more pronounced at schools with the largest number of low-income students. It has been shown that these rewards also reduce the number of items that are thrown away by 43%, which increases the cost effectiveness of the money that schools are already spending on fruit and vegetables and might increase their willingness to purchase higher quality fruit and vegetable items (since a larger share of these items will be consumed when a rewards program is in place).

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... short-term rewards may actually help children acquire a preference for fruit and vegetables, producing a positive effect on consumption over the long run. A recent study provides evidence for this finding.

Just and Price (2011) have also shown that the size of the response varies with the size of the reward. Providing a quarter reward led to a 115% increase in the consumption of fruit and vegetables, while a nickel reward led to a 50% increase. In comparison, the cost of the fruit and vegetable items was nominal, at 20¢ per serving.

A natural question arises, though, of where the funding would come from to provide these incentives. In fact, schools and governments are currently investing considerable resources to encourage healthy eating in children. A short-term rewards program could be integrated into the other efforts that schools and governments are already making. The relatively small amount of money spent on these incentives (a few dollars per student) could actually increase the return on investment of the other interventions and help children develop a pattern of fruit and vegetable consumption that will influence their choices throughout their life.

In principle, these kinds of incentives could be effective at home as well as at school. But in practice, parents may find it difficult or unseemly to try such payments at home, since there are a variety of different behaviors that parents wish to influence at home, and incentivizing this one may make it tricky to influence others (like tidying their room, reading, etc.) School food service programs may be in a unique position to provide these rewards since they are primarily focused on only one child behavior. In addition, the reward may have the benefit of communicating a social norm about the importance of eating fruit and vegetables. As such there is the possibility that parents would be willing to provide the necessary resources to provide this type of incentive program.

One of the most prominent concerns about providing incentives is the degree to which providing rewards crowds out intrinsic motivation (Lepper, Greene, and Nisbett 1973; Deci 1975). The primary concern is that a rewards program will actually cause children to eat even less fruit and vegetables once the rewards are discontinued. However, children acquire food preferences as they repeatedly try certain items. As such, short-term rewards may actually help children acquire a preference for fruit and vegetables, producing a positive effect on consumption over the long run. A recent study provides evidence for this finding (Cooke et al. 2011).

### 11. USE SOCIAL REWARDS

In addition to monetary rewards, it is also possible to incentivize the consumption of fruit and vegetables through the use of social rewards or verbal praise. In their study of a group of children (ages 4-6) in the UK, Cooke et al. (2011) randomly assigned children to receive either a tangible reward (a sticker) or verbal praise. For the verbal praise treatment, children were praised if they tasted the vegetable with a comment like, "Brilliant, you're a great taster." Tangible rewards and the social rewards led to an increase in consumption, both during the 15-day intervention, as well as during follow-up periods that occurred one and three months later. Both the tangible reward and social reward had a similar effect on whether the children reported liking vegetables, about 6 times as likely as the control group. The tangible reward increased overall intake more, to about 58 grams from 15 grams. The social reward increased consumption to about 45 grams from a similar starting point.



Unlike tangible (or monetary) rewards, social rewards may be more appropriately used in the home.

To our knowledge there have been no systematic efforts to devise “social reward” training for parents so that they can learn how to provide optimal praise for their children’s good eating habits. Many parents would welcome advice on how to get their kids to eat more fruit and vegetables; reminders or vignettes in grocery stores, community centers, and other locations, could help parents develop effective “praise” practices.

### *Planning and Habit Tools*

#### **12. CREATE PRE-COMMITMENT TOOLS**

As mentioned in the introduction, there is some evidence that people will voluntarily pre-commit to choices to avoid temptations. This finding was seen in the Ariely and Wertenbroch (2001) study where students voluntarily accepted assignment deadlines to keep on track.

To our knowledge, there have been no large-scale studies of the effectiveness of pre-commitment to fruit and vegetable consumption (or to healthier eating more generally). But in many schools and organizations the basic technology for this kind of program exists. Web tools can facilitate such programs. For example, SchoolMenu.com keeps online updates of lunch menus at thousands of schools nationwide. Through a site like this, parents (and children) may one day be able to order which items they will have for lunch in advance. Many workplace websites may have similar functionality which could allow employees to pre-commit to the items they’ll have for lunch.

On any given day at lunch, fruit and vegetables compete for attention with other less-healthy side dishes. If food decisions are made in the moment, then consumers are likely to choose the unhealthy option each day and decide that they will choose the more healthy items in the future. However, if decisions are made in advance, possibly with all of the decisions for the entire week made at the same time, then individuals will be able to pre-commit to healthy choices, and will not be driven by the immediate impulse each day to take the less healthy options.

There are also tools that can help individuals pre-commit to long-term goals that could include goals related to eating more fruit and vegetables. The website, Stickk.com, developed by two behavioral economists at Yale, allows people to make commitments, with the most common goal being to lose weight. The interesting feature of this site is that it allows individuals to make a bet that they can stick with the commitment (e.g., to lose 5 pounds in a month). If they fail, they agree to pay a specified amount of money to a “receiver” (either a friend or, in some cases, an enemy—for example, a political party that they dislike, to increase the aversion to losing the bet). There is some evidence that avoiding losses (rather than winning rewards) is a more effective way for people to self motivate, and it makes for a cheaper intervention because people put their own money at risk (Volpp 2008).

*... there have been no large-scale studies of the effectiveness of pre-commitment to fruit and vegetable consumption (or to healthier eating more generally).*



### 13. CREATE SIMPLE TRACKING TOOLS

Almost all weight-loss programs involve some kind of food tracking, often at the level of calorie counting. People who track their calories tend to lose more weight. The availability of mobile and online tools has led to a proliferation of personal tracking tools. There is now an organization, known as the Quantified Self, consisting of people who track as many elements of their life as possible.



But apart from serious tracking hobbyists, most people find extensive tracking quite annoying. Stopping to make note of everything we buy or eat disrupts the automatic, passive approach that comes so naturally to us. A failure to realize this insight about human behavior may have brought down Google Health, a branch of Google that allowed users to track their personal health. Adam Bosworth, who was the head of Google Health (but resigned in 2007), decided to form his own company devoted to simple personal tracking. That company, Keas, allows people to track their compliance with very simple behaviors (e.g., did you eat 5 servings of fruit and vegetables yesterday?), and to share their reports with friends and family.

The difference between detailed and simple tracking may reflect a difference in the intended outcome. People who want to do detailed tracking are often interested in looking at trends over time so that they can see their own progress, or perhaps even discover hidden patterns in their own behavior. The main advantage of simple tracking, on the other hand, is that it just keeps a person on track. It is a small daily reminder that you are trying to change or keep up a particular behavior. You might want to look back and see how well you have done over time, but the main purpose is just the daily reminder.

To our knowledge there have not been any large-scale tests of these tracking tools that differ in complexity, either with respect to behavioral outcomes or with respect to the goals that people are trying to achieve. In the weight-loss domain, most studies look at how much weight is lost on a particular diet. We know of only one study that compared compliance with a simple vs. complex diet (Todd 2010), and the simpler diet did much better. Much more work is needed in testing the effectiveness of interventions offering simple strategies and tracking tools.

### 14. CREATE PERSONAL STRATEGIES

Related to the work on simple tracking tools, there has been little research on simple personal strategies. The only study that we know of was done by Brian Wansink (2011), who invited participants to report simple weight-loss strategies, and their success and failure with them, on a website. Dozens of strategies were tried, and some, like using smaller plates, were more effective than others, at least in the self-reports. More formal studies of such personal strategies would be useful.

The USDA recently simplified its daily food guidelines by adopting the MyPlate graphic. Riis and Ratner (2010) have reported that an even simpler guideline, the Half Plate (often promoted by PBH) is not only easier to remember, but is also more motivating than the old food pyramid. But there has been little systematic research on how people do with simpler recommendations.

An approach worth exploring involves the development of strategy competitions in schools or workplaces where people can nominate and try different ways to eat more vegetables. Should you eat them early in the meal, chop them up, put them in soup, etc.? There is evidence that people enjoy products and activities that involve “co-creation” (Norton 2011), so not only might the ideas be better, engagement might increase enjoyment. These kinds of self-generated ideas may work particularly well, because there is evidence that we may not predict other people’s preferences very well (e.g., parents), and experts may suggest rules that are too complex for novices (Gourville 2006).

Another opportunity for changing personal strategies focuses on identifying habits that people may have but that they may not be aware of. One example suggested by Laran (2010) is that people tend to choose less healthy foods when choosing for other people than when choosing for themselves, and this seems to be because they do not focus on other people’s multiple goals of exercising self-control but only on enjoying life. People who make choices for others only focus on pleasure goals, neglecting self-control goals. Promotional messages reminding people that, “Your guests probably aspire to healthier eating, too” may prompt them to purchase more fruit and vegetables when planning parties. Another example is that people tend to eat higher-calorie foods on Fridays and weekends, and there is evidence that they are not completely aware that they are doing so (Riis and Simester, 2011). Promotional messages reminding people to “not give up healthy eating on the weekend” may influence this consumption pattern, and may be particularly important in the supermarket context because people do much more grocery shopping on weekends.

### 15. PROMOTE HABIT-STARTING OPPORTUNITIES

There is some evidence that the best opportunity to start a new habit is when other life circumstances are changing (Wood et al. 2005). Rather than waiting for people to start a new habit at home, for example, one can look for strategic moments when they might be open to starting a new routine, such as during their vacation. People often say that they don’t have enough time to change habits at home, but vacations are defined by free time. People are also open to spending money on vacations, so they may be open to opportunities to try new family eating habits. Vacation resorts like Disney, cruise ships, and hotel chains could actively facilitate positive changes in eating behavior.

Supermarkets, schools, and workplaces can also be good places for kick-starting food habits. And New Year’s is increasingly defined by the healthy eating resolutions that people make. Schools and groups like PBH could promote resolutions related to consuming more fruit and vegetables. Consumers could be encouraged to start new food habits, based on the general message of “eat more fruit and veggies.” This recommendation will be more effective, however, if it involves a specific guideline, such as “always eat half a plate of fruit and veggies at every meal.” If every meal is too onerous, people can start with one meal a day. But developing specific intentions, that is, plans with specific times and actions associated with them, is much more effective than simply setting high-level goals (Golwitzer, 1999; Stadler et al., 2010).

**Consumers could be encouraged to start new food habits, based on the general message of “eat more fruit and veggies.” This recommendation will be more effective, however, if it involves a specific guideline, such as “always eat half a plate of fruit and veggies at every meal.”**

Since snacking and TV are so closely associated, it may be possible for parents to increase their children's fruit and veggie consumption by stipulating that fruit and veggies are the only snacks that can be eaten during TV time.

New habits can also involve new eating or usage occasions. For example, people could be encouraged to eat fruit with their cereal, eat fresh carrots and hummus for breakfast, or put fresh (or frozen) chopped veggies in their canned soup. Some of these pairing habits could be facilitated at supermarkets with cross-merchandizing, but to our knowledge, systematic efforts to place fruit and veggie displays in cereal or soup aisles have not been attempted.

#### 16. ENCOURAGE ONLY FRUIT AND VEGETABLE SNACKING DURING TV TIME

There is considerable evidence that TV viewing is associated with increased calorie consumption (Robinson 1999). Why? There are at least two reasons. First, people tend to pay less attention to how much they are eating when they watch TV (Francis & Birch 2006). And, second, TV advertising frequently features calorie-dense foods that can trigger consumption or increase long-term preference for these foods (Harris et al. 2009). It has proven difficult, however, to determine the relative influence of these factors (Chandon & Wansink 2011).

Since snacking and TV are so closely associated, it may be possible for parents to increase their children's fruit and veggie consumption by stipulating that fruit and veggies are the only snacks that can be eaten during TV time. If children are less taste sensitive while engaged with TV, this may be an easy way to increase consumption. If this strategy proves effective, it could be promoted by schools and groups like PBH.

#### 17. FACILITATE PREFERENCE CHANGE

The tools mentioned thus far address opportunities to get people to choose to eat more fruit and vegetables. But is there anything that can be done to get them to like these items more? Studies of taste change generally show that introducing new flavors with currently liked flavors increases the rate of adoption. For example, many people come to like coffee only after first drinking it with a lot of sugar (Rozin 1999).

To our knowledge there has not been much experimentation with gradually introducing children to flavors, whereby, for example, small amounts of broccoli are introduced to their macaroni and cheese to increase their liking for broccoli. Some studies have attempted to simply hide the taste of veggies by serving them in a purée. For example, Spill et al. (2011) served daycare children meals that were manipulated to different degrees through the addition of vegetable purées in foods like zucchini bread, pasta and sauce, and chicken noodle casserole. The key comparison was between standard servings and servings that were reduced in energy density by 25% through the addition of a purée. Across 3 meals and a snack, the daily vegetable intake increased significantly by 73 g (73%). Children ate similar weights of food across conditions; thus, the daily energy intake decreased by 142 kcal (12%). In addition, children rated their liking of the foods similarly across conditions.

Future research could use this approach over a longer time period to see if children's preferences for veggies change over time, even when their introduction in foods has a subtle or negligible impact on taste.



## Messaging Tools

### 18. USE APPROPRIATE NUTRITION LABELING

Calorie labeling has recently been introduced on restaurant menus in some U.S. jurisdictions and has been mandated nationally under the Affordable Care Act. Studies to date have shown that the effects are modest at best, although longer-term effects may be expected. The fact that effects are modest has led some behavioral economists to argue that overeating is not a result of lack of information, but rather, is due to a lack of self-control (Loewenstein 2011, Schwartz et al. 2011).

Some restaurants are, however, beginning to offer meal portions with specific calorie limits. The chain, Seasons 52, has a menu built on portions less than 475 calories. And Applebee's launched an under 550 calorie menu. Presumably these lower-calorie meals have a higher vegetable content, but to our knowledge this has not been studied.

Other types of labeling have been attempted. Thorndike et al. (2011) used a traffic light system in a large hospital cafeteria which led to significant changes in product choice, although they do not specifically report changes in fruit and vegetables. Many grocery chains are introducing in-house or third-party labeling schemes such as Guiding Stars developed by Hannaford, Healthy Ideas by Stop'n'Shop/Giant, and NuVal, developed by David Katz of Yale and used at several chains nationwide. In these schemes, fruit and vegetables are generally at the top of the scale, but the impact on consumer purchases has not yet been systematically studied. The traffic light system used by Thorndike et al. (2011) is somewhat unique in that it actually directs customers away from unhealthy choices—many marketers are reluctant to do this, but it may be the most effective way to influence behavior. Such “negative” schemes need to be more thoroughly reviewed and evaluated.

### 19. PROMOTE NATURALNESS

Labels of “natural” and “organic” have long been used to enhance product appeal, and recent work in psychology may provide hints at how best to use these labels (Rozin 2006). This research indicates that the processing used to produce food matters a great deal; Rozin suggests people form their judgments based on emotional reactions to different kinds of processes. In addition, one of the simple rules for food choices listed in Michael Pollan's book, *Omnivore's Dilemma*, is to choose items that have the fewest different ingredients. Fruit and vegetables have a unique advantage in promoting their naturalness since they provide one of the few types of unprocessed, one-ingredient foods that can be consumed with very little preparation time. We have not seen any promotional efforts to undermine the naturalness claims of various packaged snack foods, and this may be an opportunity to increase the share of fresh fruit and vegetables, at least in the snack category. Simple laboratory studies or focus groups would be an easy way to investigate the possible effectiveness of such an approach.

### 20. HIGHLIGHT SOCIAL NORMS

Earlier we described a study that used social norms to increase the re-use of bath towels in hotel rooms. Social norms can be powerful in the food domain as well. Also mentioned earlier was the possibility that default options or shelf displays can convey

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... there have not yet been any large field studies examining social norm influences in the context of fruit and vegetables. Workplace and schools would be good settings for this kind of research.

social norms. Not only is it easier to choose default items and prominently displayed items, but the shelf position of these items alone can convey the idea that they are appropriate items to choose. David Just (2011) has noted that displaying chocolate milk in school cafeterias conveys the message to kids that it is okay to drink chocolate milk for lunch; in reality, chocolate milk is probably too caloric for most children most of the time.

Another approach to promoting social norms is to associate certain social groups (or even celebrities) with a particular behavior, as demonstrated in a healthy eating study by Berger and Rand (2008). In their study, undergraduate students were given a news article to read, suggesting that a certain social group was the greatest consumer of junk food, and then asked in a survey to choose between pairs of healthy and junk food items following the reading. The prediction was that if the social group in the article was an appealing group (i.e., one that the undergraduate student subjects would like to be associated with), then more junk food would be chosen after the students read the story. And this is what the researchers found: On average, undergraduates chose 3 out of 10 junk food items after reading the version of the article where an appealing group (in this case, other undergraduate students) ate junk food. But subjects only chose an average of 2.15 out of 10 junk food items after reading the version of the article where an unappealing group (in this case, graduate students) ate junk food. The authors argue that the latter group chose healthier food to avoid signaling their association with the unpopular graduate student group.

To our knowledge, there have not yet been any large field studies examining social norm influences in the context of fruit and vegetables. Workplace and schools would be good settings for this kind of research.

### 21. LEVERAGE LOSS AVERSION

Loss aversion was mentioned earlier in the context of commitment devices. People seem to be more motivated by the threat of loss than by the opportunity for gains or rewards. This finding may have implications for messaging that promotes fruit and vegetables. The health benefits of fruit and vegetables can be framed in two ways. Gain framing emphasizes the fact that if you eat fruit and vegetables, you consume important vitamins and nutrients. A loss frame emphasizes that if you (or your children) are not eating enough fruit and vegetables, you miss out on opportunities to consume important vitamins and nutrients. This is a subtle difference, but it has had significant effects on choices in lab studies (Kahneman and Tversky, 1977). It might be worth experimenting in the context of fruit and vegetables.





## 22. USE STRONG, APPEALING BRANDING

Roberto et al. (2010) studied how familiar cartoon characters appearing on various food packages influence children's preferences for those foods. They found that the presence of the cartoon characters on packaging significantly increased the kids' frequency for choosing each type of food. However, this effect was greatest with less healthy foods and least for vegetables such as carrots, suggesting that vegetables may be less brandable than other food types.

Efforts to create strong, appealing branding for vegetables and other healthy foods have been tried in the marketplace (e.g., Grimmway and Bolthouse with carrots, and Delhaize with a private-label packaged food line), but to our knowledge there have been no publicly available assessments of their effectiveness.

A related question is whether or not certain types of fruit and vegetables can effectively be branded as luxury products for adults. In Japan, consumers are willing to pay very high prices for some kinds of premium fruit and vegetables (even readily available commodities like table grapes and oranges) for use as gifts. To our knowledge there have been no systematic studies of why fruit and vegetables can be perceived as a luxury category in Japan, but apparently not in America. Customers in the U.S. have been willing to pay high premiums for "organic" fruit and vegetables, but there may be other category labels that would increase luxury perception and decrease price sensitivity. Fruit baskets have always been available as gifts, but bakeries and bakery sections of supermarkets rarely offer creative, sharable fruit-based gifts or desserts. To explore how fruit and vegetables could be branded as luxury products, marketing concepts could be developed through consultations with distributors and chefs, and then tested at low price points through conjoint analysis with consumers.

## SUMMARY AND CONCLUSION

A new model of human behavior is becoming more widely accepted across the social sciences. This model assumes (based on years of empirical evidence) that consumers are not perfectly rational, and that marketers and policy makers who are concerned about consumer welfare need to manage product offerings to make it easier for consumers to make better choices. There is a dose of paternalism in this approach, but only a small dose. The approach does not generally recommend banning products or eliminating choices. Consumer freedom is preserved, but an understanding of the limitations in consumers' beliefs, preferences, and decisions leads the marketer or policymaker to devise displays, tools, incentives, and promotions that make it easier for consumers to make consumption decisions that support long-term health.

In this review we have outlined tools that can help to this end. For each tool, there is at least preliminary evidence of effectiveness, but, as we noted throughout this literature review, much more work needs to be done. We hope that this review will spur some of that research.

Efforts to create strong and appealing branding for vegetables and other healthy foods have been tried in the marketplace . . . but to our knowledge there have been no publicly available assessments of their effectiveness.

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