Social Meaning in Supermarkets as a Direct Route to Improve Parents' Fruit and Vegetable Purchases

Collin R. Payne and Mihai Niculescu

Direct and indirect attempts to increase parents' fruit and vegetable purchases have had little, if any, success. Most of the disappointing results are reported in the grocery environment. In this context, embedding messages with social meaning may have a significant impact on current campaigns. We use the focus theory of normative conduct as an alternative theoretical framework and suggest that social norms that are salient, easy to interpret, and easy to compare against individuals' behavior may improve current attempts to increase parents' fruit and vegetable purchases in retail environments.

Key Words: supermarket, social norms, intervention tools, childhood obesity, fruits and vegetables, behavioral economics

Recent estimates suggest that 16.9 percent of children and adolescents age 2–19 in the United States are obese (Centers for Disease Control and Prevention 2010); this represents a 338 percent increase from when estimates were first obtained in the early 1970s. Stakeholders, such as government, food manufacturers, food retailers, and parents, have attempted to curb this increase with little, if any, success. One reason this may be is because indirect routes attempting to influence parents' food purchasing, such as government attempts through manufacturer and retail stakeholders, can result in sometimes unintentional, yet deleterious, effects, resulting in purchasing more of less healthy food (Mathios 2000, FTC 2008a, Wansink and Chandon 2006). Unlike indirect routes, direct routes give parents untainted exposure to attempts to increase healthier purchases. This route is more promising, yet questions of efficacy and feasibility remain. In response, we suggest a direct approach that considers social components of parents' food purchasing. This overlooked behavioral economic component could improve existing health interventions that target parents' food purchasing while incurring minimal expense, having potential for a large impact, and benefiting multiple stakeholders of childhood obesity.

Consider the supermarket. Nearly all major childhood obesity stakeholders inhabit this food environment where roughly 60 percent of all American food expenditures occur (USDA 2010). Despite the breadth of childhood obesity stakeholders and depth of consumer food expenditures, comparatively little health intervention research is done in the supermarket. The lack of health intervention research in supermarkets may be for two reasons: (i) supermarkets may be hesitant to engage in activities that are perceived to decrease profitability through encouraging fewer purchases (Ratner et al. 2008), and (ii) existing health intervention studies that attempt to directly leverage supermarkets as a context for health intervention research show inconsistent, if any, effects.

To address supermarkets' possible hesitancy to engage in activities that are perceived to decrease profitability, we suggest supermarket intervention research that focuses on purchase of fresh fruit and vegetables. This is for four reasons. First, fresh fruit and vegetables represent a product category that is high margin and highly perishable

Collin R. Payne and Mihai Niculescu are Assistant Professors of Marketing at New Mexico State University in Las Cruces, New Mexico.

This paper was presented as a selected paper at the workshop "Economics of Food Assistance Programs," organized by the Northeastern Agricultural and Resource Economics Association (NAREA), in Pittsburgh, Pennsylvania, July 23, 2011. The workshop received financial support from the Cornell Center for Behavioral Economics in Child Nutrition Programs and the AAEA Foundation. The views expressed in this paper are the authors' and do not necessarily represent the policies or views of the sponsoring agencies.

for supermarkets (McLaughlin 2004). Providing tools that would help turn over this product category would be attractive to them. Second, promotion of fresh fruit and vegetables does not actively demote other product categories, decreasing the likelihood that manufacturers and retailers would oppose these promotions. Third, a significant portion of children's fruit and vegetable intake—as well as their weight status (i.e., normal, overweight, or obese)—is associated with their parents' grocery purchasing patterns (Rolls, Ello-Martin, and Tohill 2004, Mushi-Brunt, Haire-Joshu, and Elliott 2007, Busick et al. 2008, Gross, Pollock, and Braun 2010, DeMattia and Denny 2008). Last, fruit and vegetable consumption is associated with not only decreased risk of developing obesity, but also diabetes and particular types of cancer (Hung et al. 2004, Hedley et al. 2004). The incidence of these conditions, unfortunately, continues to increase, while fruit and vegetable purchase and consumption continue to decrease (Casagrande et al. 2007).

To address inconsistent or null effects of supermarket intervention research, we suggest endowing attempts to influence parents' supermarket shopping with social meaning. This is because existing health intervention research in supermarkets assumes that parents make food choice and quantity decisions devoid of reference to others. Social meaning, in contrast, assumes that people are frequently externally motivated—basing food choice and quantity decisions on what they perceive others to believe is common, normal (i.e., descriptive norms), or appropriate (i.e., injunctive norms). Given parents' public grocery shopping behavior, time constraints, and limited motivation and ability to process health information from the array of 38,000 products in any particular supermarket (Food Marketing Institute 2010, Kahneman 2003), social meaning in the supermarket may be an overlooked ally in encouraging parents to purchase more fruits and vegetables.

In this descriptive theoretical work, we first review indirect and direct routes influencing parental purchases in supermarkets. We then address how embedding social meaning in direct routes may improve parents' purchasing of fresh fruits and vegetables. Finally, we discuss implications and limitations of this approach, with the intent of moving forward an until-now neglected component of parents' purchasing behavior.

Background

Consider Figure 1. It represents known stakeholder routes to influence parental purchasing in the supermarket. The existing literature has, either directly or indirectly, examined government routes 1 (e.g., WIC, SNAP) and 4 and 5 (e.g., nutrition fact panel, front-of-package labeling), manufacturer routes 6, 7, 8, and 9 (e.g., advertising, promotion, slotting), and retail route 11 (e.g., nutritional profiling). Many of these routes have resulted in unimpressive results with little evidence to suggest purchase increases of healthier foods such as fresh fruit and vegetables (Seymour et al. 2004, Jain 2005, Pomerleau et al. 2005).

These unimpressive results may be for two reasons. First, indirect routes leave open the possibility of initial stakeholder health positioning and subsequent stakeholder health repositioning, resulting in parents purchasing products believed to be healthier than they actually are. Second, while direct routes hold promise in providing untainted health positioning to parents, it is not clear whether existing tools within this route are efficacious or feasible. We suggest that existing tools do not consider how powerful social components of parents' shopping are—resulting in purchasing patterns that are guided more by what *others believe* is appropriate or normal rather than what stakeholders or consumers themselves intend. We document potential deleterious purchasing effects as a result of indirect routes and then review existing research of direct attempts to increase fruit and vegetable purchases in the supermarket. We suggest that retailer stakeholders, by leveraging social meaning, may be in the best position to provide—and may have the most to gain by doing so—direct incentives for parents to increase fruit and vegetable purchases.

Indirect Routes to Parents

A significant barrier to parental fresh fruit and vegetable purchases is money spent instead on less healthy, well-marketed packaged foods. This may be partly because commercial speech on food packaging (e.g., front-of-package labeling) changes frequently in response to government regulations—such as requiring full nutritional disclosure on most foods' packaging (e.g., nutrition fact panels) (Parmet and Smith 2007). Because of

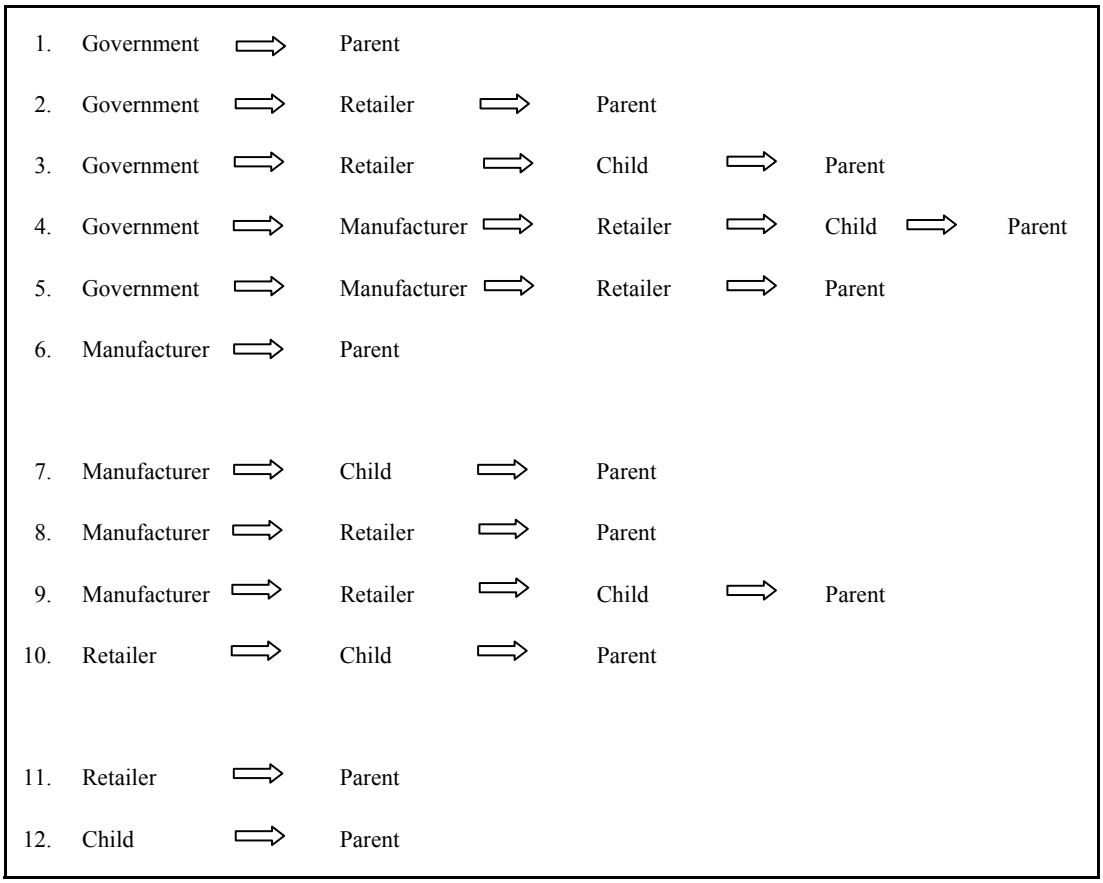

Figure 1. Indirect and Direct Routes to Parental Purchasing in Supermarkets

this disclosure, which can highlight a food's nutritional inadequacies, it is reasonable to expect a manufacturer's response to include commercial speech emphasizing a food's relative health benefits and downplaying its nutritional detriments (Pappalardo and Ringold 2000). Thus, the original governmental indirect attempt to increase healthier purchases through manufacturers and retailers can result instead in increased purchasing and consumption of foods not previously thought to be healthy (Moorman 1998, Kozup, Creyer, and Burton 2003, Mermin and Graff 2009, Salooje and Dagli 2000, Just and Payne 2009). Perhaps the most significant governmental regulation that provides an example of this process in supermarkets is the Nutrition Labeling and Education Act (NLEA) of 1990.

Two federal entities—the Food and Drug Administration (FDA) and the Federal Trade Commission (FTC)—are directly and indirectly responsible for the NLEA's enforcement. Until the NLEA of 1990, a memorandum of understanding between the FTC and FDA stipulated that FDA's regulatory authority resided in food labeling, while FTC's regulatory authority resided in food advertising (FTC 1994, FDA 1994). Since the NLEA of 1990, the FDA has broader authority to "…require nutrition labeling of most foods regulated by the Agency; and to require that all nutrient content claims (i.e., 'high fiber', 'low fat', etc.) and health claims be consistent with agency regulations" (FDA 1994, p. 2). In addition, the NLEA also employs the FDA to "consider goals such as educating consumers about proper nutri-

tion and promoting healthy dietary choices, in addition to preventing false or misleading claims" (FDA 1994, p. 2).

The Federal Trade Commission, in contrast, is not directly compelled by the NLEA, but follows its own statutes stipulated by the FTC act, "…which provides authority to prevent unfair or deceptive practices but does not go so far as to encompass educational or public health goals" (FTC 1994). However, this consumer health intervention act, which compels both federal entities to monitor commercial speech, is not competitive, but complementary in its enforcement. One recent commercial activity which both the FDA and FTC are examining closely is front-of-package commercial speech (FTC 2009).

Front-of-package nutrition messages include manufacturer-initiated programs such as "sensible solutions," "smart spot," and the food manufacturing industry's "smart choice" program. All programs occurred subsequent to the Nutrition Labeling and Education Act of 1990, and many imply that they exist as a result of it (FTC 2008a). While these symbols may provide information efficiently to consumers—instead of consumers having to rely only on nutrition fact panels on the back of packaging—they may also have unintended consequences. For example, front-of-package health symbols strategically placed in retail supermarkets have been shown to bias perceptions of appropriate serving sizes (i.e., "I can eat more of these 'fat free' cookies") and increase permissibility of less healthy foods (i.e., "Fruit Loops is a 'Smart Choice'?!") (Wansink and Chandon 2006, FTC 2008a).

One reason why federally mandated nutrition disclosure does not seem to be as prominent as front-of-package commercial speech in terms of the supposed effect on parental decision making is because of particular assumptions made about consumers. For example, a former FTC Chairwoman states, "Our job is not to substitute our judgment for that of consumers … it is to ensure that they get the information they need to make their own choices" (FTC 2008b). In theory, this suggests that government attempts to increase consumer health in supermarkets rely on traditional economic models which assume that once people obtain health information, they will choose types and amounts of foods that maximize their long-term well-being (Just and Payne 2009, Elster 1989). In practice, parents may not have the time, ability, or motivation to analyze difficult-to-understand nutrition fact panels located on the back of packaging (USDA 2009). Parents may instead rely on cognitive shortcuts or decision aids in the form of nutrition symbols, short messages on the front of packages, or what others believe is normal or appropriate to buy (Wansink 2004).

Indirect routes to parents can result in deleterious effects such that more of less healthy foods are purchased. Direct routes, in contrast, have the potential to expose parents to unadulterated attempts to influence their shopping behavior. Unfortunately, direct routes have not proven much better. Common tools used—such as promotion, economic, and nutritional information—have shown little evidence of effectiveness.

Direct Routes to Parents

Table 1 represents a comprehensive list of known studies regarding direct attempts to influence adult purchases of fresh fruits and vegetables. While not all of the studies listed in Table 1 target parents specifically, they implicitly include them as a subset of adult population. Generally speaking, the ten studies can be classified into three groups: promotion, economic, and nutritional information. In only two cases (Curhan 1974, Mhurchu et al. 2010) is there evidence of positive effects on fresh fruit and vegetable purchases, while the rest either show mixed or no significant effects.

Promotion. Evidence suggesting that promotional efforts increase fruit and vegetable purchases is modest. Most notably, nutritional profiling, such as the 1–3 star [e.g., *Guiding Stars* program (Fisher and Day 2008)] and 1–100 point [e.g., *NuVal* (Katz et al. 2007)] food rating systems have become very popular with forward-thinking retailers. The idea here is that parents could easily compare the overall nutritional benefits between any product on the grocery shelf by simply comparing the number of stars or points. The enthusiasm, however, for these promotional tools has been tempered with inconclusive results. Preliminary evidence from the star system, for example, suggests no change in fruit and vegetable purchases in grocery stores since its implementation (Martin 2007) and only a 1.39 percent

Table 1. Direct Attempts Influencing Supermarket Fresh Fruit and Vegetable Purchases

Source	Tool	Sample	Result
	PROMOTION		
Sutherland, Kaley, and Fischer (2010)	Nutritional profiling: 3-tier star-coded icons point-of-purchase	Sales data 168 stores	Effect: unclear; no specific data for fruit and vegetables, but increase of star-coded items over 2 yrs = 1.39%
Curhan (1974)	Display space, price, newspaper advertising, location quality	Sales data 4 stores	Effect: positive; increased display space for all fruit and vegetables; price for soft fruit; advertising and prime location on hard fruit and cooked vegetables; $p \leq .25$ used as criterion
Gittelsohn et al. (2007)	Out-of-store mass media (radio, newspaper ads, video) and in-store demonstrations/taste tests/shelf labeling	287	Effect: mixed; increase in purchasing of local vegetables; no difference for local fruit or imported vegetables
	ECONOMIC		
Anliker, Winne, and Drake (1992)	Fruit and vegetable coupons	489	Effect: unclear; 79.1% used some coupons, 57% used all; don't know base purchasing
Mhurchu et al. (2010)	Fruit and vegetable price discounts, education, discount and education	1,104	Effect: positive; discounts of 12.5% increased fruit and vegetables by 1.06 lbs/week after 6 months and 0.62 lbs after 12-months. No effect for education.
Herman et al. (2008)	Fruit and vegetable vouchers for low-income women	454	Effect: unclear; 90% vouchers redeemed ($10 value)/week; don't know base purchasing
Herman, Harrison, and Jenks (2006)	Fruit and vegetable vouchers for low-income women	602	Effect: unclear; 90% vouchers redeemed ($10 value)/week; increased self-reported consumption of fruits and vegetables by about 1 serving; don't know base purchasing
	INFORMATION		
Winett et al. (1991)	Interactive kiosk system	77	Effect: none
Anderson et al. (2001)	Interactive kiosk system	296	Effect: none
Rodgers et al. (1994)	Shelf labels, food guides, produce signs, monthly bulletins	Sales data 40 treatment, 40 control stores	Effect: unclear; significant 2.4% increase in market share for fresh produce compared to control, but didn't control for population characteristics and treatment store's sale of salad items

increase in purchase of starred items over a period of two years (Sutherland, Kaley, and Fischer 2010).

In perhaps the most comprehensive field test of promotional effects on fruit and vegetable purchases, Curhan (1974) describes a complex fractional factorial experimental design in four grocery stores. Promotional tools such as display space, advertising, and prime location are tested. Increased display space significantly increased purchase of all fruits and vegetables tested, while advertising and prime location increased purchase

of hard fruit (e.g., apples, limes) and cooking vegetables (e.g., corn, squash). It is difficult, nevertheless, to assess the practical strength of these results, as $p \leq .25$ is used as a criterion for statistical significance, and fractional factorial designs can result in main effects that are indistinguishable from higher-order interactions, making interpretation of results difficult if not impossible.

Last, Gittelsohn et al. (2007) used mass media such as radio announcements and newspaper ads, as well as cooking demonstrations, taste tests, and shelf-labeling in 23 grocery stores in the Marshall Islands. Effects were mixed. Even though reported exposure to these efforts was high, only purchasing of local vegetables increased, while local fruit and imported vegetables did not.

Economic. Some supermarket intervention studies attempting to affect fruit and vegetable purchases use economic incentives as tools. While there is evidence that people use these incentives—such as coupons and vouchers—there is no knowledge of purchasing patterns before coupon use. For example, Anliker, Winne, and Drake (1992), Herman, Harrison, and Jenks (2006), and Herman et al. (2008) found that while a majority of participants in their studies redeemed the vouchers and coupons for fresh fruit and vegetables, base purchasing patterns remained unknown. This makes impossible a reasonable evaluation of these economic incentives. Further, these interventions can be cost-prohibitive: Herman, Harrison, and Jenks (2006) describe spending nearly $90,000 in coupons for just over 600 participants.

Finally, the only instance where solid evidence exists regarding economic incentives affecting fruit and vegetable purchases is from Mhurchu et al. (2010). In this study, a 12.5 percent discount, which was the removal of a food tax, increased fruit and vegetable purchases by 1.06 pounds a week compared to base purchasing rates. After six months the tax was returned, yet the significant effect continued; at twelve months, fruit and vegetables increased by 0.62 pounds a week compared to base purchasing patterns. Even, however, if economic tools are found to significantly affect fruit and vegetable purchases—which, currently, only one study suggests—it remains unclear how practical these interventions are, not knowing who (e.g., taxpayers) would pay for these types of programs.

Nutritional information. Several supermarket intervention studies have attempted to affect fruit and vegetable purchases via information campaigns. The assumption is that consumers do not have access to relevant health information that would allow them to make better decisions. For example, interactive kiosks at supermarkets have been used to provide nutrition information, tailored nutrition guidance, and goal planning (Winett et al. 1991, Anderson et al. 2001). Unfortunately, these kiosks did not result in increases of fruit and vegetable purchases.

Other information campaigns include shelf nutrition information, food guides, and monthly nutrition bulletins (Rodgers et al. 1994). As compared to 40 control stores in a different geographic region, treatment stores gained 2.4 percent in market share for fresh produce. This small increase in produce purchases was tempered by the fact that treatment stores instituted sales of salad items during the study.

Direct routes, despite their promise of exposing parents to unadulterated attempts to influence their shopping behavior, remain ineffective or impractical because of the existing tools found within this route. Direct routes, however, may be improved—and novel tools created—by considering a previously neglected component of parents' grocery shopping: social meaning.

Social Meaning

It is frequently assumed that grocery shoppers (i.e., parents) choose foods in a social vacuum; that is, information (i.e., nutrition, price, or promotion) is provided to shoppers who presumably make decisions without reference to others' behavior (Just and Payne 2009). While this assumption may hold for closed laboratory settings, it is rarely true in real life situations.

The efficacy of social norms, or "rules and standards that are understood by members of a group, and that guide and/or constrain social behavior without the force of laws" (Cialdini and Trost 1998, p. 152), implies that human behavior is frequently externally motivated—especially in public contexts (Ariely and Levav 2000). Perceptions of common, normal, or appropriate behavior of others are taken as evidence of how to behave. So efficacious are social norms that they are known to influence a great variety of behaviors—

such as littering, alcohol and tobacco use, risky driving, environment protection, and recycling (Cialdini, Reno, and Kallgren 1990, Donaldson et al. 1995, Prentice and Miller 1993, Cialdini 2003, Schultz 1999). Social norm research has yet to make inroads in the supermarket regarding encouraging increased purchasing of fruits and vegetables, but there is tantalizing evidence suggesting as much. Smith-McLallen and Fishbein (2008), for example, found social norms (e.g., frequency of friends and family who engage in behavior) to be highly predictive of intentions to consume fruits and vegetables. Social norms (e.g., observing others' scripted behavior) have also been shown to be highly predictive of both type of food chosen (i.e., healthy vs. less healthy) and amount of food consumed (Burger et al. 2010, Reynolds et al. 2004, McFerran et al. 2010).

Other studies regarding social norms and food suggest that the same socially derived norms can have both positive and negative impacts on food choice and consumption (Herman, Roth, and Polivy 2003, Ariely and Levav 2000). With similar norms leading to sometimes opposite (and less desirable) outcomes, greater predictive control is needed. In response, focus theory of normative conduct helps provide guidance regarding not only when specific types of norms should work (i.e., when they are salient), but also in what direction (i.e., increase or decrease) targeted behaviors are likely to ensue as a result of the social norm (Fisher 2010, Fisher and Dubé 2011, Cialdini, Reno, and Kallgren 1990, Kallgren, Reno, and Cialdini 2000, Schultz et al. 2007).

Focus Theory of Normative Conduct

Focus theory of normative conduct addresses two main issues—and implies a third—affecting the predictive power of social norms. First, social norms impact behavior when the appropriate norm is *salient* (Schultz et al. 2007). Focusing one's attention, for example, on a particular norm (whether the norm is true or not) makes it easily accessible in one's mind while at the same time inhibits competing norms (Anderson 1976, Higgins 1996). Second, norms impact behavior when they are *easy-to-interpret reference points*. These reference points can be descriptive (i.e., what behavior is common) or prescriptive (i.e., what behavior should be)—knowing the difference can result in different predictions of behavior (Kallgren, Reno, and Cialdini 2000, Cialdini, Reno, and Kallgren 1990). Third, social norms impact individuals' behavior when that behavior is *easily compared* to a salient norm (Schultz et al. 2007). If it is difficult to compare one's behavior to a salient norm, it becomes impossible to change that behavior. These three issues are discussed further.

Salience of social norms. Despite the documented powerful effects of social norms on behavior, in many instances the appropriate social norms can escape detection. Pluralistic ignorance, for example, is when a person assumes incorrectly that a particular norm is widely accepted, but is privately rejected by that same person. This can lead to accidental adherence to a false public norm (Prentice and Miller 1993). It could also be the reason why, for example, it has been found that greater quantities of food are purchased when a person setting an example is thin (McFerran et al. 2010); that is, even though someone may not privately believe that someone who is thin buys greater quantities of food, seeing a thin person buy greater amounts may suggest public permission for such behavior. Retailers should be careful not to induce compliance with misperceived social norms and instead to provide social norms that are truthfully descriptive and prescriptive of healthier purchasing patterns.

Ease of interpretation. Social norms pose health value to consumers in the supermarket if they can be easily interpreted as reference points for their own behavior. Ease of interpretability of social norm reference points allows quick decisions to be made in the supermarket when parents' time, ability, and motivation for deliberation amongst products may be limited. Two types of reference points to consider in the supermarket are descriptive and injunctive social norms.

Descriptive norms suggest to others what behaviors are common and as a consequence should be imitated. It is suggested that these norms influence others' behavior because individuals have a constant drive to evaluate themselves. When objective cues are not available (or are uninformative), people rely on social comparisons to know how to behave (Festinger 1954). As a result, these social cues become mental shortcuts during deci-

sion making, especially under conditions of relative uncertainty. People assume that if most people engage in a certain behavior, engaging in that behavior must be the right thing to do. Following descriptive norms is a safe way for a person to avoid social disagreement by contradicting other individuals' public behaviors. Further, the more the person identifies himself with the group conforming to norms, the more likely the change in his behavior (Cialdini 1988).

In contrast to descriptive norms that define what *is* done in common situations, injunctive norms suggest what individuals *should* do (Cialdini, Reno, and Kallgren 1990, Reno, Cialdini, and Kallgren 1993). Injunctive norms convey messages of social approval/disapproval (Kallgren, Reno, and Cialdini 2000). They help individuals interpret their own behavior against socially expected behaviors by providing rules to follow (e.g., "Don't grocery shop on an empty stomach," "Shop only the grocery store perimeter," "Don't shop with kids around," "Buy only fresh food," "Check for the expiration date," "Buy extra for the weekend").

Overall, evidence suggests that injunctive norms are more predictive in changing behavior than descriptive norms, yet the two types of norms perform best in conjunction with each other (e.g., Cialdini, Reno, and Kallgren 1990). Schultz et al. (2007), for example, studied the influence of descriptive and injunctive social norms on household energy consumption. Descriptive norms that depicted customers' energy use compared to other customers' average energy use were effective in decreasing energy consumption of heavy users, but not users whose energy consumption was already low. For these users, the descriptive norm actually increased their energy usage—an undesirable result. To mitigate this undesirable result, injunctive norms (via emoticons) were introduced, with the descriptive norm reinforcing already below average energy consumption (via smile emoticons), resulting in still low energy usage, and discouraged above-average energy consumption (via frown emoticons), resulting in reduced energy consumption. The *ease of comparability* between energy users' current behavior in reference to what was socially approved and typical of the average energy usage of others is thought to be the reason behind users tempering their energy consumption.

Ease of comparability. For individuals to be able to change their behavior in reference to a salient social norm, it is important that their own behavior is easily compared to the average behavior described and prescribed. For example, packaging information acknowledging percent daily values of various minerals and vitamins advertises an implicit injunctive norm (i.e., "each day you should consume 100 percent of this nutrient, of which this product contains 12 percent). However, activating this norm (its salience may already be low) may not work. It is impossible to forecast at the supermarket if—per person (i.e., purchasing for children) and per serving—a particular product will contribute to or detract from likely consumption behaviors at home. In other words, because actual consumption behavior of particular vitamins and minerals at home is not easily compared to the injunctive norm of percent daily values, it is impossible to know if one needs to buy more or less of a product. A better approach may be to provide information to consumers that would tell them what they would need to do to "work off" the calories of the particular product. Recent evidence, for example, suggests that providing individuals with the physical activity equivalent of calories on labels can significantly reduce the likelihood of purchase of caloric beverages (Bleich et al. 2012).

Taken together, social norm salience, ease of interpretation, and ease of comparability provide a reasonable guideline for understanding how existing attempts to increase parents' fruit and vegetable purchases may be improved. This guideline is used to critically re-evaluate Table 1 in light of the strength of explicit or implicit social norms associated with aforementioned direct attempts (i.e., promotion, economic, information) to increase parents' fruit and vegetable purchases.

Social Norms in Supermarket Shopping

While prior attempts to increase parents' fruit and vegetable purchases have ignored social norms, to some extent they might have benefited from accidental norm activation. Consider Table 2. It maps Table 1 onto the social norm guidelines of *salience*, *ease of interpretation*, and *ease of comparability*. On the one hand, we expect intervention tools (e.g., promotion, economic, information) that

Table 2. Embedding Effective Social Meaning Into Existing and Novel Direct Attempts

	Norm Salience		Easy-to-Interpret Social Norm			
	Descriptive Norms	Injunctive Norms	Social Reference Point (Descriptive Norm)	Social Rule (Injunctive Norm)	Own Behavior	Comments
PROMOTION						
Nutritional profiling, shelf labeling	none	weak	use absolute values; labels not descriptive of actual behavior	ambiguous/mixed norms: buy healthier vs. buy less calories	no	focus is on product, but not on behavior
Display space, location quality	weak	weak	opportunity for noticing others' behavior	e.g., one should buy popular products; one should secure scarce products	no	social validation and scarcity principles apply; tool lacks social norm salience
Out-of-store mass media, in-store demos	weak	strong	e.g., regular people buy product X (when regular spokespeople are portrayed)	e.g., buy healthier; you should buy X to look like the endorser (when attractive spokesperson is portrayed)	weak evidence/ none	friendship and liking principle applies; should work better for injunctive norms that have higher salience
ECONOMIC						
Coupons	weak	strong	e.g., average person uses coupons; sensible people use coupons	e.g., one should take advantage of limited time opportunities; be considerate with money	yes	scarcity principle applies
Discounts	weak	strong	e.g., average people use discounts	e.g., buy more when discounted (i.e., it's on sale); secure opportunity when available	yes	scarcity principle applies; corollary to scarcity principle: if a discount becomes permanent, it will be less powerful
Vouchers	strong	strong	e.g., less fortunate individuals use vouchers; one uses vouchers for needs (vs. wants)	e.g., secure opportunity provided by vouchers	yes	change in norms may be required to avoid potential stigma associated with vouchers; vouchers cannot be used for vices, as government restricts choice to what is good for consumer
INFORMATION						
Kiosk system	none	weak	none	one should follow authority requests	no	access to regulations is difficult during shopping
Food guides	none	weak	none	one should use government suggestions	no	authority principle applies
Produce signs	weak	weak	absolute values, not descriptive of others' behavior	advertised food is better/popular; buy fresh food.	no	only provide product information (vs. information on what people do or should do)

result in behavioral change to possess inherent social characteristics. Effective tools may activate descriptive and injunctive norms that are simultaneously salient, easy to interpret, and easy to compare. On the other hand, we suggest that unsuccessful interventions may lack at least one social prerequisite crucial to social norm activation.

Promotion-based tools. First, a common theme across all promotion-based tools is their relative inability to create social norm salience (as opposed to product information salience). We suspect that a focus on product instead of behavior may shift an individual's attention away from the social component of grocery shopping. Second, messages display information in absolute value (vs. relative to what other people buy). Therefore, they provide no (social) reference point to anchor a social standard (i.e., descriptive norms). Third, promotion-based information may be easy to compare within a product category (i.e., *Guiding Stars* profiling), but not against parents' own behaviors. While shopping, for example, few parents actually compare product information against recent consumption patterns to make informed decisions about what and how much to buy.

Promotion-based tools, however, have the potential to activate (mostly) injunctive norms. Messages in mass media (e.g., "An apple a day keeps the doctor away") may focus attention toward healthy purchasing principles—such as "One should buy healthier/look for low calories." Particularly, mass media and in-store demonstrations may use spokespeople to suggest that "Regular people buy product X" (descriptive norm) or "You should buy product X to become/look like the endorser" (injunctive norm). The applicability of such norms is, however, tempered by low salience and difficult comparability of parents' grocery shopping behavior to the social norm.

Economic-based tools. Consistently effective, economic-based tools may also be prone to social norm activation during exposure to them. Coupons or discounts could trigger descriptive (e.g., "Sensible people use coupons," "Average people use discounts") and injunctive norms (e.g., "One should take advantage of limited time opportunities to secure product") that shoppers can easily compare to their own behavior. However, a problem may occur with vouchers due to their cultural association with individuals of certain socioeconomic status (e.g., "One uses vouchers for needs, not for wants").

Mixed reactions predicted by descriptive norms may lead to increased use of coupons for fruit and vegetable purchases by both over- and under-norm average grocery shoppers. A gain to the consumers, such an effect would diminish gross margin on fruit and vegetables for supermarkets, and subsequently qualify as the least preferred option in the marketing arsenal of a supermarket. Overall impact of descriptive norms on behavior may be limited by the low/moderate saliency, but the impediment can be reduced or even eliminated if salient injunctive norms are used instead. Injunctive norms' expected positive effects stem from the tendency of individuals to weigh losses more than gains of a similar magnitude (i.e., loss aversion) and the scarcity principle implied (e.g., "Take advantage of rare opportunities") (Cialdini 1988). Therefore, injunctive norms in this category should work better in the context of limited-time discount availability.

Information-based tools. "Eat for Health" and "Shop Smart for Your Heart" are two of several programs that have extensively used food guides, monthly bulletins, or brochures in high traffic areas to increase purchases of fruits and vegetables, with disappointing results (see Table 1). Nevertheless, the situation would have been predictable from a social norm theory perspective. A cursory search for social components within information-based tools leads to little evidence. Programs in this category focus on detailed product information, and not on behavior. As a consequence, attention is directed toward product attributes, and steered away from the social aspect of purchasing.

Lack of norm salience, however, does not imply lack of social norms. A strong association between category tools, such as kiosk systems or food guides, with government suggestions can potentially trigger an injunctive norm ("One should follow government suggestions"). The norm originates from a powerful social compliance technique (i.e., the authority principle), suggesting that individuals are more likely to comply with requests from authority figures, such as government bodies (Cialdini 1988).

Discussion

Focusing on providing social norms for parents' fruit and vegetable purchasing (vs. other foods) accomplishes an important goal. Previous attempts to influence parents' supermarket shopping do not explicitly consider how these attempts affect multiple stakeholders (i.e., government, manufacturer, and retailer). The assumption is that if an attempt to increase or decrease purchases results in an expected public health behavior, a store should implement it for the greater good of the consumer. While this is a noble assumption, it may be shortsighted. Attempts to improve parents' grocery shopping purchases may do so at the expense of purchasing other foods in quantities historically profitable to a supermarket. This could result in total revenue decreases—a situation that would remove an attempt from supermarkets' and food manufacturers' consideration.

To mitigate this possibility, attempts should focus on increasing higher profit margin, highly perishable fresh fruit and vegetable purchases to meet volume expectations suggested to parents by particular social norms. Promotion of social norms guiding fruit and vegetable purchases does not actively demote purchases of "everything else." In this way, increases in fresh fruit and vegetable purchases should augment rather than completely replace parents' "everything else" purchases. Even if supermarkets' revenue from a social norm-based supermarket intervention is the same or slightly less than the revenue from business as usual, its profit—because of greater purchases of higher margin fresh fruit and vegetables—should be equal or greater.

Finally, embedding social norms within attempts to influence parents' fruit and vegetable purchases is not a panacea. There are at least three challenges to this approach. First, in some instances it may be difficult to provide accurate descriptive information (i.e., what healthy shopping behaviors are most frequent or normal) to parents. That is, it may be difficult to obtain information about actual purchasing patterns that is actually truthful. This becomes a problem if, for example, parents perceive a social norm (both descriptive and injunctive) to be too heavy-handed because it deviates too greatly from the actual experience of the parent. In this case, parents may simply ignore or do the opposite of what is suggested regarding what should happen (i.e., injunctive norm) or what already happens (i.e., descriptive norm).

Second, communities may reside in "food deserts" (Schafft, Jensen, and Hinrichs 2009); that is, some communities find it difficult to obtain fresh fruit and vegetables because of access and income. In the first case, the absence of grocery stores in some lower-income communities would obviously remove the possibility of using social norms to increase parents' fresh fruit and vegetable purchases. In the second case, even if communities have access to fresh fruits and vegetables, it may be difficult for some segments of these communities to afford them. In this case, economic tools such as sliding subsidies based on income for fruits and vegetables may still—in addition to providing social norms—provide the desperately needed increase in fruit and vegetable purchases and consumption.

Third, it is unknown whether people from particular segments of the population (e.g., parents/non-parents, collectivistic/individualistic immigrants, low/high income, younger/older) respond differently to the same descriptive or injunctive norms in the supermarket. In contexts other than obtaining and eating food, for example, evidence suggests that those from collectivistic cultures may be more prone to conform to a community norm than those from individualistic cultures (Cialdini and Goldstein 2004).

Conclusion

Childhood obesity prevention may have an overlooked ally: social norms in the supermarket. Embedding social meaning within direct attempts to influence parents' purchasing of fruits and vegetables in the supermarket may result in children consuming more of these obesity-preventive foods (Hung et al. 2004). In particular, helping parents focus on what purchasing behaviors *should* occur (e.g., "half of your cart should contain fruits and vegetables") and what purchasing behaviors *actually* occur (e.g., 68 percent of grocery shoppers buy fruits and vegetables) can provide a benchmark for their behavior—either reinforcing their current shopping behavior or helping move their shopping behavior in the intended direction. This would contrast current indirect and direct attempts to influence fruit and vegetable purchases that have had inconsistent, if any, effects.

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