

Retailer Marketing Strategies and Customer Purchasing of Sweetened Beverages in Convenience Stores

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ARTICLE INFORMATION

Article history:

Submitted 10 December 2021

Accepted 25 February 2022

Keywords:

Sugar-sweetened beverages
 Consumer marketing
 Customer purchases
 Convenience stores
 Store manager priorities

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<https://doi.org/10.1016/j.jand.2022.02.017>

ABSTRACT

Background Marketing strategies for sweetened beverages (SBs) are pervasive across food retail. Yet few studies have examined how these strategies associate with planned and unplanned SB purchasing.

Objective This study aimed to examine whether customers with greater exposure to SB retail marketing (eg, advertisements and product placement) were more likely to purchase an SB and whether this varied by customer characteristics.

Design This was an observational, cross-sectional study using objective customer purchasing and store assessment data from convenience and other small food stores.

Participants/setting Participants were 1,604 food and beverage customers at 144 randomly sampled convenience and other small food stores in Minneapolis-St Paul, MN.

Exposure Marketing strategies, including SB advertisements, placement, and shelf space were included.

Main outcome measures We determined the probability of customers purchasing ≥ 4 fluid ounces of a ready-to-drink sugar and/or artificially sweetened beverage.

Statistical analyses performed Associations between marketing strategies and purchasing were estimated using mixed regression models, controlling for customer characteristics and accounting for customers nested within stores.

Results Fifty-six percent of customers purchased an SB; 14% also specified that it was an unplanned purchase. Customers were more likely to purchase an SB when exterior advertisements ($P < .001$) and advertisements hanging from the ceiling ($P < .001$) that promoted SBs were present. Customers with moderate and high cumulative exposure to SB marketing were significantly more likely to purchase SBs (51.2% and 54.9%, respectively) than those with lower exposure (34%); this effect was particularly salient for men. There were no significant associations between retail marketing strategies and unplanned purchases.

Conclusions Findings demonstrate that feasible and sustainable approaches are required from policy makers, retailers, and public health professionals to shift store environments away from cues that promote unhealthy beverage selections. Given that numerous retail actors are invested in the availability, promotion, and sales of SBs, changing the predominance of SB marketing in convenience stores will likely be challenging and require cross-sector collaboration.

J Acad Nutr Diet. 2022; ■(■):■-■.

SUGAR- AND ARTIFICIALLY SWEETENED BEVERAGES (SBs) are key contributors to poor population health. For decades, research has found that individuals with high and habitual intakes of sugar-SBs have an increased risk for excess weight and cardiovascular consequences,¹⁻⁴ and observational studies suggest similar outcomes among SBs with artificial sweeteners.^{5,6} Although ubiquitously available across food retail, these beverages are particularly popular at convenience and other small food stores,^{7,8} which are highly prevalent in urban areas^{9,10} and serve as important outlets for purchasing in low-income communities.¹¹

An increasingly recognized target to curb SB consumption in public health has been in-store product marketing.¹²⁻¹⁹ Each

year, food and beverage manufacturers invest significant funds and use a suite of marketing tactics to entice customer purchases and maximize business profits.¹⁹⁻²¹ Some estimates suggest 70% of food and beverage marketing budgets are prioritized to in-store marketing vs other forms of advertising (eg, airwaves)²² and \$1 trillion is spent annually for in-store product promotions among consumer good product companies.²³⁻²⁵ Such a commitment of resources translates to high product exposures among retail customers, with prior observational studies identifying on average 25 to 30 different locations of SB products within a single store.^{26,27} Yet, these practices are not easily avoided by individual customers nor within their control, and they have strong potential to

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influence customer decision making and behavior in ways that can go unrecognized and thus unresisted.²⁸⁻³²

Despite the growing focus to modify retail marketing strategies and understand their links with the healthfulness of customer purchases, several literature gaps remain. First, as highlighted in a recent systematic review by Shaw and colleagues,¹² most research has focused on the placement and availability of healthy foods and beverages and not unhealthy products. Houghtaling and colleagues¹³ similarly found a limited number of studies for their review that focused on the in-store marketing and availability of SB products specifically. Some of the limited focus on SB and other unhealthy products may relate to the difficulty measuring products that have a large and ubiquitous store presence, as well as the challenges that exist around changing their in-store marketing approaches. For instance, a recent experimental pilot aimed at improving the healthfulness of store settings acknowledged that confectionary products remained at the store entrance and in freestanding aisle displays during the intervention, as these products already had paid marketing space.³³ Cohen and colleagues³⁴ offer one of the few pioneering studies that have examined in-store marketing of SBs and their relationships with customer outcomes, and they identified a positive association with customer body mass index. Yet, like most of the healthy and unhealthy in-store marketing literature, the stores studied were primarily grocery stores and supermarkets, highlighting an ongoing knowledge gap in the effect of these marketing practices on unhealthy purchasing at convenience stores. Furthermore, previous research has not distinguished relationships between in-store marketing practices and different types of planned and impulsive customer purchases. Given impulse purchasing has been estimated to account for billions in annual sales for food and beverage companies,³⁵ understanding whether differences exist is important.

This study aimed to address these gaps around retailer marketing and customer purchasing of SBs using store audits and observed customer purchasing data at convenience and other small food stores. We first examined whether customers with a greater exposure to SB retail marketing strategies (eg, advertisements and impulse placement) were more likely to purchase SBs, including making an SB impulse purchase. We then explored whether these associations varied across different customer population groups (eg, gender and age) to identify who may be disproportionately influenced by these marketing tactics. Last, we described retailer-reported priorities and vendor practices related to SBs to contextualize some of the reasons marketing strategies are predominant in these retail sites and the challenges that exist in addressing them. Understanding which SB marketing strategies are associated with customer purchases would inform policies and interventions aimed at limiting SB selections in convenience stores.

MATERIALS AND METHODS

Study Design and Data Collection

We used data collected as part of the STaple foods ORdinance Evaluation (STORE) study. STORE examined the effects of the Minneapolis Staple Foods Ordinance, which required stores to stock a minimum amount and variety of healthy staple

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Research Question: Are customers with a greater exposure to sweetened beverage retail marketing strategies (eg, advertisements and product placement) in convenience and other small food stores more likely to purchase sugar- and/or artificially sweetened beverages?

Key Findings: In this cross-sectional study of 1,604 customers at 144 randomly sampled stores, mixed regression models revealed that customers who were exposed to sweetened beverage advertisements and accumulating marketing approaches were more likely to purchase sweetened beverages than those who were not exposed.

foods (eg, fruits, whole grains), on the healthfulness of store environments and customer purchases.³⁶ The study examined these effects in convenience and other small food stores that were required to comply with the ordinance but pre-policy were not regularly offering the ordinance-required products. The ordinance did not address SB products nor retailer marketing features of interest in this study.

Data were collected at annual time points from 2014 through 2017 in Minneapolis, MN as well as St Paul, MN—an adjacent city that served as the study's comparison site. Convenience and other small food stores were randomly selected on the basis of administrative lists of licensed retailers in both cities, as described previously.^{36,37} Of the 180 stores randomly sampled (90 in Minneapolis, 90 in St Paul), 25 stores did not provide consent or were deemed ineligible for the primary study (eg, exempt from the ordinance, a supermarket, or going out of business), resulting in 155 participating stores. The study size was based on the sample size of stores and customers needed to detect a change in store environment and customer purchases over time. The University of Minnesota Institutional Review Board approved all human subjects study protocols (1311S45924). Informed consent was obtained from individuals before their participation.

Data pertaining to SB retailer marketing strategies, retailer priorities and vendor practices, and customer purchases for each store were collected at each time point by teams of 2 trained data collectors. Store visits primarily occurred on weekdays between 10:00 AM and 7:00 PM. Store assessments, including SB retailer marketing strategies, were performed by data collectors with permission from a store employee, and store managers or owners were invited to participate in an interviewer-administered survey that asked about retailer priorities and vendor practices. Intercept interviews with customers exiting the stores were performed at a follow-up store visit. Customers that appeared to be 18 years or older and had a visible food or beverage purchase were invited to participate. Food and beverage purchases made by eligible customers were visualized and recorded by data collectors and a brief survey collected information about customers' socio-demographics (age, gender, and race and ethnicity). Additional details on data collection methods, participant response rates, and store and customer eligibility have been previously published.³⁶⁻³⁹ The data collection tools used for the study are available online via the University of Minnesota Data

Repository (<https://conservancy.umn.edu/handle/11299/203078>).

Retailer Marketing Strategies and Customer Purchasing of SBs

Sample. To examine associations between retailer marketing strategies and customer purchasing of SBs, we used data from 2016 and 2017, which were the only time points with data on one of our key outcomes—impulsive customer purchases. The analytic sample included 144 stores (79 in Minneapolis and 65 in St Paul) and 1,604 customers. Forty percent of stores were food-gas marts, 36% were convenience or corner stores, 15% were pharmacies, 9% were “dollar” stores, and <1% were categorized as a general retailer. Most stores (90%) were authorized to accept Supplemental Nutrition Assistance Program customer benefits, 56% were corporate/franchise-owned, and 44% had independent ownership.

Measures. We examined 5 retailer marketing strategies related to the placement and promotion of SBs. Measures were based on a tool originally developed by the CX³ retail scoring system,⁴⁰ which was modified for the current study.⁴¹ For all measures, we did not distinguish between sugar- and artificially-based SBs, as these products are commonly placed together in stores using similar marketing approaches, beverage products that contain both sugar and artificial sweeteners are becoming increasingly common,⁴² and evidence suggests that customers are not always confident or accurate in identifying which beverages contain sugar vs artificial sweeteners.⁴³

SB Advertisements and Impulse Placement. Four marketing measures involved retailer advertisements or impulse placement. Data collectors recorded whether there were any images of “unhealthy” foods (eg, soda or other SBs, including diet drinks, sweet desserts, and highly sugared cereals) on the doors, windows, or other exterior areas of the storefront (present/absent). Data collectors also recorded whether there were any advertisements or promotions of sweetened drinks, either soda, energy drinks, and/or other SBs, hanging from the store’s ceiling (present/absent) or near the checkout area (present/absent). Impulse placement of SBs at the checkout was assessed by recording whether there was soda, energy drinks, or other sugary drinks within reach of the cash register (present/absent). Inter-rater agreement for the marketing characteristics ranged from 88 to 100%.

SB Shelf Space. Shelf space of SBs was the fifth marketing strategy examined. SBs, which included all beverages except unflavored water (ie, without added caloric or noncaloric sweeteners), unsweetened milk, 100% juice, and alcohol, were measured in inches using a standard tape measure and rounded to the nearest foot. Because shelf space measurements for SBs were not conducted in 2016, we imputed measures from the same stores in 2017. To capture variation in customers’ exposure to the universal availability of SBs in these stores, we categorized shelf space into 3 levels (<125 feet, 125 to 225 feet, and >225 feet).

Cumulative Exposure to SB Store Marketing Strategies.

We created a summative score (range, 0 to 5) of the 5 potential SB marketing strategies experienced by customers at a store to assess the cumulative exposure to SB retail marketing strategies. A value of 1 was assigned for each of the 4 advertisement and impulse placement measures that were present, and values of 0, 0.5, and 1 were assigned for the 3 levels of the SB shelf space. We then categorized the cumulative variable into lower (scores between 0 and 1), moderate (scores between 1.5 and 3), or high (scores between 3.5 and 5) exposure to SB retail marketing.

Customer SB Purchases. After being recorded by data collectors in customer intercept interviews, food and beverage purchase data were entered by trained staff at each time point into the Nutrition Data System for Research software, versions 2015 and 2017.^{44,45} The software generates nutrient and food serving values for product categories.⁴⁶ We characterized customers as making any SB purchase if they purchased a version of at least 4 fluid ounces of a sugar-SB (any nonalcoholic beverage with added sugar or combination of sugar and artificial sweeteners) or artificially sweetened SB (any nonalcoholic beverage with only artificial or non-nutritive sweeteners) of any size or package. Customers who made an SB purchase and specified in the customer intercept survey that the purchase was not planned before going to the store were also characterized as making an impulse SB purchase.

Retailer Priorities and Vendor Practices

Sample. To describe retailer priorities and vendor practices related to SBs, we used data collected at the same stores at baseline in 2014—the only time point when SB vendor practices were reported by managers. As reported previously,³⁸ the sample consisted of 78 managers, who were predominantly men (68%), non-Hispanic White (69%), and worked in the store for a mean (standard deviation) of 3.9 (6.4) years.

Measures. We examined 8 retailer priorities and vendor practices related to SB stocking as reported by store managers. Three items pertaining to retailer priorities asked managers to rate the importance of offering SBs to attract customers to their store (1 = not at all important to 5 = very important); the difficulty to reduce the store’s shelf space for stocking soda pop (1 = extremely easy to 5 = extremely difficult); and the importance profit had in deciding which food and beverage products to offer (1 = not at all important to 3 = very important). Managers also reported on 5 vendor practices, including whether prices for products were determined in part by the suggested price from the manufacturer or distributor (yes/no); the frequency of store visits from SB sales representatives, distributors, and wholesalers (0 = never, source ourselves to 5 = weekly or more often); the degree of control SB sales representatives, distributors, or wholesalers have over displays and shelving units (1 = no control to 5 = total control); as well as among those that reported at least “a little” control, the locations of the displays with control (checkout area, aisle shelf, end cap or free-standing display, or other); and the degree of control SB sales

representatives, distributors, or wholesalers have over signs, advertisements, and other in-store promotional materials (1 = no control to 5 = total control).

Statistical Analysis

We calculated descriptive statistics for all measures, including customer exposure to SB retail marketing strategies, customer purchasing outcomes, and customer sociodemographics. To examine associations between retailer marketing strategies and purchasing outcomes, we computed mixed regression models that examined whether each retailer marketing strategy separately was associated with making any SB purchase, controlling for time point, customer confounders (age, race and ethnicity, and gender), a fixed effect for the study design (Minneapolis/St Paul), and a random effect to account for nesting of customers within stores. We repeated the same set of models to examine the associations between each retail marketing strategy and making an impulse SB purchase. We then examined the association between the cumulative exposure to SB marketing strategies at a store with both outcomes. Results from all models are presented as predicted percentages of customers with standard errors.

For purchasing outcomes significantly associated ($P < .05$) with the cumulative marketing exposure variable, we explored whether the association varied by customer sociodemographic groups. We present results of effect modification on the additive (rather than multiplicative) scale, given measuring interactions on the additive scale has been specified as the more appropriate measure for public health.⁴⁷⁻⁵⁰ We calculated the relative excess risk due to interaction for each dichotomized customer sociodemographic group (men vs women, non-Hispanic White vs customers of color, younger than 50 years vs 50 years or older) with the 3-category cumulative exposure to SB retail marketing strategies variable and compared moderate- and high-exposure categories to lower exposure in separate models. Models were adjusted for customer confounders (age, race and ethnicity, and gender), a fixed effect for the study design (Minneapolis/St Paul), time point, and a random effect to account for nesting of customers within stores. For models with strong evidence of an additive interaction, we calculated adjusted relative risks for the cumulative exposure categories stratified by sociodemographic group.

Last, we calculated descriptive percentages for retailer priorities and vendor practices related to SBs, as reported by managers.

All analyses were performed using SAS software, version 9.4,⁵¹ except for the relative excess risk due to interaction, which were performed in Stata, version 15.1.⁵² Significance was set at $\alpha \leq .05$.

RESULTS

Retailer Marketing Strategies and Customer Purchasing of SBs

Table 1 presents the SB purchasing outcomes, sociodemographic characteristics, and exposure to retail marketing strategies for the 1,604 customers. Fifty-six percent of customers purchased an SB, and 14% made an impulse SB purchase. More than one-half of customers were aged between 18 and 39 years; 42% were women; and the sample was diverse in terms of race and ethnicity. Sixty-nine percent of customers

Table 1. Purchasing outcomes, characteristics, and percent of customers exposed to sweetened-beverage retailer marketing strategies among convenience and other small food stores (n = 1,604 customers), Minneapolis-St Paul, MN, 2016-2017

Characteristic	Data, n (%)
Purchasing Outcomes	
Made any SB ^a purchase	891 (56)
Made an impulse SB purchase	222 (14)
Customer Characteristics	
Age	
18-39 y	877 (55)
40-59 y	548 (35)
≥60 y	156 (10)
Gender, woman	670 (42)
Race/ethnicity	
Non-Hispanic white	611 (39)
Non-Hispanic black	612 (39)
Hispanic	82 (5)
Non-Hispanic other racial group ^b	279 (18)
Customer Exposure to Retailer Marketing	
Unhealthy food and beverage exterior ads ^c	1,099 (69)
SB ads or promotions hanging from ceiling	616 (38)
SB ads or promotions near the checkout	537 (33)
SB impulse placement at checkout	1,134 (71)
SB shelf space (in feet) ^d	
High (>225)	555 (37)
Moderate (125-225)	767 (51)
Lower (<125)	190 (13)
Cumulative exposure to SB marketing (range 0-5) ^e	
High exposure (>3)	447 (30)
Moderate exposure (>1-3)	923 (62)
Lower exposure (≤1)	124 (8)

^aSB = sugar- and/or artificially sweetened beverage.

^bNon-Hispanic other included: n = 69 non-Hispanic American Indian/Native Alaskan, n = 51 non-Hispanic Asian, n = 85 non-Hispanic racial category not captured or Pacific Islander/Native Hawaiian, n = 74 non-Hispanic more than 1 racial group.

^cAdvertisements on doors, windows, or other exterior areas of the storefront of unhealthy food and beverages (ie, high-calorie, low-nutrient foods and beverages that include alcoholic beverages, soft drinks and other sweetened beverages, including diet drinks, sweet desserts and highly sugared cereals, chips and other salty snacks, most solid fats, fried foods, and other foods with high amounts of sugar, fat, and/or sodium (eg, hot dog); n = 1,586 customers with complete information.

^dSB shelf space was not measured in 2016. Data from 2017 were imputed for stores measured in 2016; n = 1,512 customers with complete information.

^eCumulative count of the 5 individual SB marketing practices experienced by customers; n = 1,494 with complete information.

were exposed to unhealthy food and beverage ads on the store exterior, and approximately one-third were exposed to ads hanging from the ceiling (38%) or near the checkout (33%).

Table 2. Prevalence of sweetened beverage purchasing by customers across marketing practices at convenience and other small food stores (n = 1,604 customers), Minneapolis-St Paul, MN, 2016-2017

Store characteristic	Made any SB ^a Purchase ^b		Made an Impulse SB Purchase ^b	
	% (SE) ^c	P value	% (SE)	P value
Unhealthy food and beverage exterior ads^d				
Yes	54.6 (2.6)	<.0001	11.6 (1.5)	.10
No (ref)	41.4 (3.3)		14.6 (2.0)	
SB ads or promotions hanging from ceiling				
Yes	58.7 (2.5)	<.0001	14.3 (1.9)	.13
No (ref)	45.6 (3.0)		11.6 (1.5)	
SB ads or promotions near the checkout				
Yes		.78		.77
No (ref)	49.8 (3.4)		12.1 (2.1)	
SB impulse placement at checkout				
Yes		.70		.92
No (ref)	50.0 (2.8)		12.5 (1.6)	
SB shelf space (in feet)^e				
High		.07		.34
Moderate	47.1 (3.1)		14.5 (2.1)	
Lower (ref)	55.1 (3.2)		11.6 (1.5)	
Cumulative exposure to SB marketing (range, 0-5)^f				
High		.01		.70
Moderate	54.9 (3.0)		11.8 (2.1)	
Lower (ref)	51.2 (3.0)		13.3 (1.5)	
	34.0 (5.2)		14.0 (3.4)	

^aSB = sugar- and/or artificially sweetened beverage.

^bAll models controlled for customer age, gender, race/ethnicity, a city effect to account for the study design, time point, and included store identification as a random effect due to nesting of customers within stores. Values in bold indicate significant differences from reference group.

^cSE = standard error.

^dAdvertisements on the doors, windows, or other exterior areas of the storefront of unhealthy food and beverages (ie, high-calorie, low-nutrient foods and beverages that include alcoholic beverages, soft drinks, and other SBs, including diet drinks, sweet desserts and highly sugared cereals, chips and other salty snacks, most solid fats, fried foods, and other foods with high amounts of sugar, fat, and/or sodium (eg, hot dog).

^eSB shelf space was not measured in 2016. Data from 2017 were imputed for stores measured in 2016. Lower shelf space was <125 feet, moderate was 125-225 feet, and high was >225 feet.

^fCumulative count of the 5 individual SB marketing practices experienced among customers. Lower exposure was ≤1 practice, moderate exposure was >1 to 3 practices, and high exposure was more than 3 practices.

Impulse placement of SBs was common (71%) and 13% of customers were exposed to <125 feet of SB shelf space. Thirty percent of customers made purchases at stores with a high cumulative exposure to SB marketing strategies, and 8% of customers made purchases at stores with lower exposure.

Table 2 presents the adjusted associations between the retail marketing strategies and SB purchasing. Purchasing of SBs was higher among customers exposed to unhealthy food and beverage ads on store exteriors ($P < .0001$) and SB ads or promotions hanging from store ceilings ($P < .0001$). SB purchasing was also significantly greater among customers with high (55%) and moderate (51%) exposure to SB retail strategies relative to customers with lower exposure (34%). There were no significant associations identified between the retail marketing strategies and making an impulse SB purchase.

Given the significant association between cumulative exposure to retail marketing strategies and customer

purchasing of any SB, we examined whether this association varied across sociodemographic groups. There was evidence of an additive interaction comparing moderate vs lower marketing exposure by gender (relative excess risk due to interaction 0.40; 95% CI 0.13 to 0.67; $P = .004$) (Table 3). Compared with women (relative risk 1.15; 95% CI 0.86 to 1.54), men were more likely to make an SB purchase when in a moderate vs lower SB marketing store environment (relative risk 1.73; 95% CI 1.22 to 2.44). There was not clear evidence of an additive interaction comparing high vs lower marketing exposure by gender (Table 3) or for any comparison among the age and race and ethnicity sociodemographic groups (data not shown).

Retailer Priorities and Vendor Practices

Table 4 presents manager-reported retailer priorities and vendor practices related to offering SBs in convenience and

Table 3. Additive interaction between customer gender and cumulative exposure to sweetened beverage marketing practices for any sweetened beverage purchasing by customers and relative risks of any sweetened beverage purchasing by customers across cumulative exposure to marketing practices stratified by gender (n=1494 customers), Minneapolis-St. Paul, USA, 2016-2017

	Cumulative Exposure to Sweetened Beverage Marketing	
	Moderate v. Lower	High v. Lower
Additive Interaction with Customer Gender	RERI (95% CI) ^{a,b} 0.40 (0.13–0.67)	RERI (95% CI) ^{a,b} 0.17 (-0.13–0.47)
<i>p</i> -value	<i>p</i> =0.004	<i>p</i> =0.26
Stratified Models	RR (95% CI) ^{a,c}	RR (95% CI) ^{a,c}
Gender		
Women	1.15 (0.86-1.54)	1.36 (1.03-1.80)
Men	1.73 (1.22-2.44)	1.67 (1.17-2.38)

^aRERI, relative excess risk due to interaction; RR, relative risk.

^bModels for RERI adjusted for customer age, gender, race/ethnicity, a city effect to account for the study design, time point, and included store identification as a random effect due to nesting of customers within stores; 'moderate' and 'high' marketing exposure were separately compared to 'lower' marketing exposure.

^cModels for relative risks were stratified by gender and adjusted for customer age, race/ethnicity, a city effect to account for the study design, time point, and included store identification as a random effect due to nesting of customers within stores.

small food stores. Most of the managers reported that SBs are quite or very important to attracting customers to their store; it would be difficult to reduce the store's SB shelf space; profit was very important in deciding what food and beverage products to offer; and, prices for products are determined, in part, by the suggested price from the food and beverage manufacturer or distributor. Seventy-nine percent of managers reported that SB vendors, sales representatives, or distributors visited their stores at least weekly. Approximately two-thirds reported that SB distributors had at least "a little" control over SB store displays, coolers, and shelving units, with aisle shelves and coolers/other displays being the most common locations where distributors had control. One-half of managers (53%) also reported that SB distributors controlled SB store signs, advertisements or other promotional materials.

DISCUSSION

Retailer marketing strategies of SBs are pervasive features across food stores, yet few studies have been able to examine the ways different strategies and their cumulative exposure associate with customer purchasing. Among a random sample of convenience and other small food stores in Minneapolis-St Paul, MN, we found that customers were more likely to make an SB purchase when there were exterior advertisements and advertisements hanging from the ceiling that promoted SBs. We also identified that customers with greater cumulative exposure to any SB retail marketing were more likely to purchase SBs than those with lower exposure, and that this effect was particularly salient for men. In addition, we identified that changing SB marketing and availability in these venues will be difficult, given both retailer priorities and vendor practices reinforce the ubiquity of these products in convenience stores.

Both exterior advertisements and those hanging from the ceiling were associated with greater customer purchasing of SBs, which is consistent with findings from Adjoian and

colleagues⁵³ that significantly more SB advertisements among corner stores in higher vs lower SB consumption neighborhoods. Such results suggest that these visual stimuli may provide a priming effect for SB purchases in convenience stores. Eye-tracking research has demonstrated that store advertisements can have a major impact on the subsequent visual attention and consideration of products by customers⁵⁴ and that paying more attention to a product can result in a greater chance to purchase it.⁵⁵ As a result, interest and resources to understand, manage, and evaluate the effects from what customers see has been growing among companies with goals of elevating profits.⁵⁶

In contrast, we did not identify significant associations between SB purchasing and the marketing features in the checkout area where impulsive purchasing behaviors are targeted. Prior research has demonstrated mixed results in the ways product placement in the checkout area influence purchasing.^{37,56-58} Our results add to this literature and raise questions about whether the effects of checkouts at convenience and small food stores might differ from other store types (eg, grocery stores), as snacks for immediate consumption might be selected more consistently before checkout at convenience stores.

Our results also suggest that exposure to SB marketing tactics is associated with customer purchasing behavior in a cumulative manner, as customers in lower-exposure settings were significantly less likely to make an SB purchase than those in moderate- or high-exposure environments. Similar cumulative exposure results have been identified previously,³⁴ and other research has demonstrated that different SB marketing strategies each have a significant independent effect on SB sales in mutually adjusted models.⁵⁹ Together, this suggests that modifications to marketing strategies may be needed across an entire store environment rather than targeting a single area or strategy, which has been much of the focus of prior research^{12,14} and policy.^{60,61} Although identifying which marketing strategies have the strongest impact on

Table 4. Retailer priorities and vendor practices among convenience and other small food stores as reported by managers (n = 78), Minneapolis-St Paul, MN, 2014

Retailer priorities and vendor practices	Data, n (%)
Importance of SBs^a to attract customers to store	
Quite/very	67 (86)
Not/a little/somewhat	11 (14)
Store ability to reduce shelf space for soda pop	
Extremely/somewhat difficult	54 (72)
Not difficult	21 (28)
Importance of profit in deciding food and beverages to offer	
Very	50 (67)
Somewhat	21 (28)
Not	4 (5)
Prices for products are in part determined by using the suggested price from the manufacturer, distributor, or corporate office	
Yes	66 (85)
No/missing	12 (15)
Frequency of store visits by SB sales representative or distributors	
At least weekly	60 (79)
Monthly	5 (7)
At most quarterly/self-source	11 (14)
Sales representative/distributor control over SB displays, coolers, and shelving units	
Total/quite a bit	22 (29)
Some/a little	30 (39)
No control	25 (32)
Locations of SB displays controlled by sales reps/ distributors^b	
Checkout area	10 (19)
Aisle shelf	24 (46)
End cap or freestanding display	13 (25)
Coolers or other displays	26 (50)
Sales representative/distributor control over SB signs, ads, other in-store promotional material	
Total/quite a bit	13 (17)
Some/a little	27 (36)
No control	35 (47)

^aSB = sugar- and/or artificially sweetened beverage.

^bAmong managers reporting "total/quite a bit" or "some/a little" degree of sales representative and distributor control over displays, coolers, and shelving units (n = 52).

customer behavior can inform the strategies to prioritize,¹⁹ focusing attention narrowly may also create opportunities for new tactics to be developed and employed. Our findings also suggested that men—common consumers of SBs^{62,63}—may be particularly vulnerable to the influence of marketing, warranting further research into understanding the implications marketing strategies may have on different groups.^{13,19}

Lastly, in surveys with managers, we identified that changing the predominance of SB marketing in convenience stores will be highly challenging, as numerous retail actors are invested in the availability, promotion, and sales of SBs. Nearly 9 in 10 managers identified SBs as a key product in attracting customers to their store, and SB distributors demonstrated notable control and influence over SB pricing, placement, and advertisements. Prior research has documented the key role that SB vendors play in convenience and other small food stores, as approximately 80% of stores report having an incentive-based agreement with SB suppliers.⁶⁴ Such agreements shape the placement, promotion, and price of SBs and may make an important difference in the limited profit margins known across convenience stores.^{64,65} Providing this context not only highlights the significant influence vendors have on these sites, but the challenges that exist in identifying sustainable solutions that can improve public health while considering the financial constraints of small independently owned stores.⁶⁶

Limitations

Although this study used objectively collected store and purchase data from a random sample of convenience and other small food stores to examine associations between marketing strategies and customer purchasing of SBs, there are several limitations to note. First, our study design cannot imply a causal relationship between in-store marketing and food purchasing, given that the associations examined were cross-sectional. In addition, our measures of in-store SB marketing are only some of the numerous ways these could be captured and decisions on how to categorize exposure were at times challenging and crude. For example, we classified shelf space into lower, moderate, and high availability to capture a reasonable proportion of customers with lower exposure to SB availability. Yet it is difficult to determine whether 125 feet of shelf space in smaller-format stores is truly a low exposure—exemplifying both the predominance of these beverages and the challenges that exist in assessing marketing effects in universally unhealthy settings. Future research may benefit from measuring the relative rather than absolute shelf space devoted to SBs. Additional limitations to consider are that measures of SB advertisements and impulse placement only examined presence and not quantity, shelf space measures were not collected in 2016, and we did not assess marketing that precedes a store visit (eg, circular ads).

Another consideration is that the study was conducted in a specific geographic area; however, results are consistent with purchase patterns in other studies of small urban retailers and are unlikely to be specific to the region. Finally, we measured impulse (unplanned) purchases by asking customers whether they had planned to make that purchase before visiting the store; this approach makes it difficult to discern whether we only caught the most conscious impulse purchases. For instance, it is unclear how a customer would

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answer the question if they planned on buying a beverage before going to the store but had not decided the beverage type (eg, SB or water) before entering. Future work into refining the measurement and definition of impulsive purchasing would advance insight into the ways impulsive behavior is influenced within a retail setting.

CONCLUSIONS

Currently, the retail food environment is one in which the unhealthy choice is the easy choice. Products, like SBs, are highly promoted, ubiquitous, and cheap. Marketing and promotion practices by beverage manufacturers shape the placement, promotion, and price of these products,^{19,20} and thus are key targets for policy makers, local coalitions, and other public health professionals with goals to limit unhealthy products, such as SBs. Yet, for any solution to be feasible and sustainable, consideration for the impact on retailers is necessary. Incentive programs that could provide retailers with the safety net to take risks and identify in-store promotional strategies that support healthier beverage selections may be one approach. At the same time, accountability measures for beverage manufacturers may be required to improve the proportion of sales from their healthier beverage options and limit their influence and control around SB product displays, pricing incentives, and other promotional materials. Without these steps, we are asking consumers to overcome the onslaught of cues and availability that promote SBs and other unhealthy selections, which seems both impractical and unreasonable.

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STATEMENT OF POTENTIAL CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

FUNDING/SUPPORT

Research reported in this publication was supported by the National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health under award number R01DK104348 (principal investigator [PI]: M. Laska); the Health Promotion and Disease Prevention Research Center supported by Cooperative Agreement Number 5U48DP005022 from the Centers for Disease Control and Prevention (PI: M. Laska). The National Center for Advancing Translational Sciences supported data management under award number UL1TR000114. Further support was provided to M. R. Winkler and K. Lenk by the National Heart, Lung, and Blood Institute under award numbers K99HL144824 and R00HL144824 (PI: M. Winkler). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or Centers for Disease Control and Prevention. Funding agencies had no role in the design, analysis or writing of this article.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Kristen Klingler and Nora Gordon at the Minneapolis Health Department for their partnership on this work and remarkable expertise on local small food stores. The authors would also like to acknowledge the extensive efforts of those who assisted with data acquisition and management, including Caitlin Caspi, Stacey Moe, Pamela Carr-Manthe, Jennifer Pelletier and Bill Baker. Finally, we thank the retailers and customers who generously participated in this study. We have received permission to acknowledge those named.

AUTHOR CONTRIBUTIONS

M. R. Winkler was responsible for formulating research questions, leading the analysis and results interpretation, and manuscript writing. K. Lenk performed data analysis, contributed to writing/revision of the manuscript, and supported carrying out the study from which these data originated. D. J. Erickson assisted and provided feedback on the analysis, interpreting results, and manuscript writing and revisions. M. N. Laska was responsible for leading the overall study from which these data originated, including conception/design, funding acquisition and implementation; provided feedback on research questions, analyses/interpretation of results, and writing/revision of the manuscript.