

A qualitative exploration of parents', youths' and food establishment managers' perceptions of beverage industry self-regulation for obesity prevention

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Abstract

Objective: We aimed to explore the range of stakeholders' perceptions of the Balance Calories Initiative (BCI), under which the American Beverage Association pledged to decrease per capita US consumption of beverage energy by 20% by 2025.

Design: Semi-structured cross-sectional interviews were conducted in 2017.

Setting: Participants were recruited from communities targeted by the BCI (Montgomery, AL; North Mississippi Delta, MS; Eastern Los Angeles, CA).

Participants: A total of thirty-three parents and thirty-eight youths aged 10–17 years were recruited through youth-serving organizations, street intercept and snowball sampling; sixteen store/restaurant managers were recruited at businesses. Participants were asked about their awareness of the BCI. Parents and youths were asked to 'think aloud' as they viewed BCI messages (e.g. 'Balance What You Eat, Drink, and Do') and managers were asked about beverage marketing.

Results: Twelve parents and twenty-four youths had seen BCI messages; only four managers were aware of the BCI. Many parents and youths showed some misunderstanding of BCI messages (e.g. that they should drink more sugar-sweetened beverages (SSB) or they needed to equalize healthy and unhealthy beverage intake). Only one manager had communicated with beverage companies about the BCI.

Conclusions: We found mixed comprehension and low awareness of BCI messages in communities targeted by the American Beverage Association for reduced SSB consumption. Industry self-regulation attempts to reduce SSB consumption may have limited effectiveness if stakeholder input is not addressed. Public health practitioners should be aware of the need to address youths' and parents' misunderstandings about SSB consumption, especially in BCI-targeted communities.

Keywords
Industry self-regulation
Obesity prevention
Qualitative
Sugar-sweetened beverages

Sugar-sweetened beverages (SSB) contribute to multiple health problems among adults worldwide^(1–3), including obesity among youths overall^(4–13) and among Black and Latino youths in particular^(14,15). Lowering SSB consumption can reduce youths' BMI^(16,17). In 2009–2010, energy from beverages ('beverage calories') accounted for 21.1% of total energy intake (from all sources) among US youths in the form of added sugars, although there was a decrease in energy from beverages over time from 2001 to 2010⁽¹⁸⁾.

A primary public policy response to the obesity epidemic has been industry self-regulation, such as voluntary commitments to change marketing practices⁽¹⁹⁾. However,

self-regulation has been questioned in terms of effectiveness and industry compliance, given that companies' main motivation is to sell their product^(20,21). One self-regulatory response is the Balance Calories Initiative (BCI), a partnership in 2014 between the American Beverage Association and the Alliance for a Healthier Generation⁽²²⁾, under which the American Beverage Association pledged to decrease per capita consumption of energy from beverages by 20% by 2025 (<http://www.balanceus.org/>; <http://www.kickthecan.info/system/files/Balanced%20Calories%20Initiative.pdf>). The BCI has two components: (i) the National Initiative, which aims to reduce beverage calories nationally; and (ii) the Communities



Fig. 1 (colour online) Balance Calories Initiative logos and messaging

Initiative, which aims to reduce beverage calories in eight to ten US communities that have had less access to or lower sales of no- or reduced-calorie beverages. The American Beverage Association is a trade association that represents the US's non-alcoholic beverage industry; it includes Coca-Cola Co., PepsiCo Inc. and Keurig Dr Pepper. The Alliance for a Healthier Generation, which was founded by the American Heart Association and the Clinton Foundation, aims to reduce the prevalence of childhood obesity and to empower youths to develop lifelong, healthy habits by working with schools, companies, community organizations, health-care professionals and families to transform conditions and systems.

A key BCI component is targeted and tailored engagement of pilot lower-income communities. The local initiative started in communities in Eastern Los Angeles, CA, followed by Little Rock, AK, and then communities in New York City, with an October 2016 roll-out to Montgomery, AL and the North Mississippi Delta, MS. Targeted local activities may include introducing and expanding new reduced-calorie products and smaller-portion packages; changing product placement (e.g. end-aisle and checkout displays featuring only reduced-calorie beverages, repositioning reduced-calorie beverages on shelves); providing coupons and other promotions for no-

and reduced-calorie options; conducting taste tests; and putting messages about energy balance on beverage coolers and billboards.

As of 2017, at least two BCI logos had been advanced, with messages stating: 'Find your balance, find your flavor' (Picture 1, Fig. 1; paired with pictures of regular and diet beverages such as soda and iced tea; see <https://www.drpeppersnapplegroup.com/company/balance>); 'Balance What You Eat, Drink, and Do' (Picture 2, Fig. 1; shown with pictograms of a set of utensils, a cup with a straw and a running figure; see <http://www.cokeconsolidated.com/wellness>); and 'Balance What You Eat, Drink, and Do', paired with the explanatory text, 'More Beverage Choices, Smaller Portions, Less Sugar', especially on billboards (Picture 3, Fig. 1). These pictures were sometimes shown with beverage company logos (e.g. Coca-Cola) and messages were presented in Spanish in some neighbourhoods.

Research has examined perceptions of beverage advertising and labelling, and how viewing beverage advertising can influence beverage consumption. Relevant to the BCI, a focus group study found that a nutritional logo with the phrase 'Balance your energy' was not well understood and rated negatively, and physical activity pictograms (e.g. walking figure) depicted next to calorie counts were negatively viewed as inducing guilt⁽²³⁾.

The present research qualitatively assessed awareness and range of perceptions of the BCI and its messages among key stakeholders, including parents of children aged 0–17 years, children aged 10–17 years, and store and restaurant managers. We explored participants' comprehension of the messages, including the extent to which they understood the campaign's overall intent to decrease SSB consumption.

Methods

Participants

Participants were drawn from three communities targeted by the BCI because of their low sales of no- and reduced-calorie beverages: Montgomery, AL; North Mississippi Delta, MS; and Eastern Los Angeles, CA; note that all three communities have high obesity rates⁽²⁴⁾. Semi-structured interviews were conducted with thirty-three parents of children under 18 years old (ten in CA, eleven in AL, twelve in MS), thirty-eight youths aged 10–17 years (twelve in CA, fourteen in AL, twelve in MS), six supermarket store managers (two in CA, two in AL, two in MS), six convenience store managers (two in CA, two in AL, two in MS) and four restaurant managers (one in CA, one in AL, two in MS).

Parents were eligible if they were the legal caregiver of a child under 18 years, and youths were eligible if they were 10–17 years old. Parents and youths were recruited through youth-serving organizations, via street intercept near food establishments and parks, and by

snowball sampling. Specially, directors of youth-serving organizations were asked to arrange times when youths and parents could be interviewed (e.g. before or after an already scheduled activity); study interviewers were present at the organization during those times to answer questions and conduct interviews. Interviewers also approached adults with children in parks or entering or leaving food establishments (e.g. fast-food restaurants, grocery stores), described the study and asked if they wanted to participate; if so, they were taken to a nearby quiet space (e.g. a picnic table) for the interview. Participants were asked to refer other parents and youths who might be eligible for the study. Parents provided written informed consent for themselves and their children, and youths provided assent.

Managers were recruited at their businesses and were eligible if they were the manager or owner of the establishment. Interviewers visited the business during work hours and asked to talk to the manager, to whom they described the study; if managers were interested in being interviewed, they were interviewed at their business at a mutually agreed-upon time. Managers provided oral informed consent.

Semi-structured interview protocol

Participants were asked to 'think aloud' as they viewed pictures of BCI logos, signage and text. The think aloud protocol is useful for evaluating how participants interpret and comprehend material^(25–27), and here was applied to assess understanding of the intent and meaning of BCI taglines, images and logos. Specifically, parents and youths were shown each of the three BCI images described above (Fig. 1). For each picture, they were asked if they had seen the image before and to think aloud as they looked at the image ('Tell me everything that you are thinking as you look at this picture. Tell me what you think this picture is saying, in your own words'). Participants were also asked to rate each picture from 1 ('difficult to understand') to 5 ('easy to understand') and the reasons for their response. Parents and adolescents were given \$US 30 in gift cards for local food establishments for participation; managers were given \$US 30 in either cash or gift cards. Interviews were conducted between March and August of 2017.

Qualitative analysis

We conducted thematic coding on the transcripts⁽²⁸⁾. As an initial step, two team members developed two codebooks: one for parents and youths (who answered similar questions) and one for store/restaurant managers. To develop the codebooks, the two team members first independently reviewed all open-ended responses and wrote up summary notes, and then met to determine essential codes and a coding tree⁽²⁹⁾. For parents and youths, the codebook captured misunderstandings of BCI

messages (general misunderstandings about the overall meaning of the picture and definitions of words such as 'balance'; specific misunderstandings about SSB, e.g. that some SSB are healthier than others, that drinking SSB will not be harmful if one also eats healthy foods and/or exercises) or understandings of BCI messages (i.e. that it is important to drink healthy no- and reduced-calorie beverages, exercise and eat healthy foods). Understandings of some but not all aspects of the message were coded as 'mixed understandings'. Comments about the underlying intent of the advertisement (e.g. to sell SSB) were also coded. For managers, narratives were coded in terms of awareness of the BCI, beverage marketing strategies, store/restaurant relationship with beverage companies and suggestions for reducing SSB consumption. Interviewers also conducted in-store observations (by walking around the perimeter and down each aisle, and checking coolers) and coded whether BCI logos were displayed.

Once initial codebooks were developed, the codebooks were refined in an iterative process: each coder independently coded a transcript and then met to discuss agreements as well as areas of lack of clarity, to determine whether the coding scheme needed to be changed or refined (e.g. with a more specific definition of a code). After both coders agreed on the codebook, they independently marked areas of text pertaining to the final codes in 10% of the parent and youth transcripts (seven total) and 19% of the store/restaurant manager transcripts (one of each type). Coder consistency across responses was good ($\kappa=0.90$ across codes for parent and youth interviews; $\kappa=0.77$ for manager interviews)⁽³⁰⁾. After coder consistency was achieved, both coders coded all remaining transcripts independently and met to discuss and resolve any discrepancies.

Coders noted that similar themes tended to be repeated in later interviews and no new codes were added after initial coding was completed; thus, we believe that saturation was reached within each category of participants.

Results

Descriptive statistics

As shown in Table 1, 58% of parents were mothers and 42% of youths were female. Two-thirds of parents and more than two-thirds of youths were Black/African American, and 27% of parents and 39% of youths were Latino; all Black/African-American participants were drawn from AL and MS, and all Latino participants were drawn from CA. Over 70% of parents and over 80% of youths drank SSB at least a few times per week. Fewer parents (n 12; 36%) than youths (n 24; 63%) had seen any BCI message: about a quarter of parents and youths had seen Picture 1, about a fifth of parents and 40% of youths

Table 1 Descriptive characteristics of US parents and youths, recruited from communities targeted by the Balance Calories Initiative, who participated in qualitative interviews in March–August 2017

Characteristic	Parents (n 33)	Youths aged 10–17 years (n 38)
Female (%)	57.6	42.1
Age (years), mean	36.5	12.8
SD	11.0	2.0
Race/ethnicity (%)		
Black/African American	66.6	68.4
Latino	27.3	38.6
White	6.1	0.0
Region, n		
East Los Angeles/Boyle Heights, CA	10	12
Montgomery, AL	11	14
North Mississippi Delta, MS	12	12
SSB consumption, mean*	2.1	2.0
SD	1.2	0.8
Every day (%)	36.4	21.1
A few times per week (%)	36.4	60.5
Once per week (%)	15.2	13.2
Twice per month (%)	3.0	5.3
Once per month (%)	9.1	0.0
Less than once per month/never (%)	0.0	0.0
Picture 1		
Ever seen (% yes)	24.2	23.7
Understanding, mean†	3.7	3.4
SD	1.2	1.2
Picture 2		
Ever seen (% yes)	21.2	39.5
Understanding, mean†	4.6	4.5
SD	0.8	0.8
Picture 3		
Ever seen (% yes)	12.1	28.9
Understanding, mean†	4.5	4.3
SD	1.0	1.0

*1 = every day; 2 = a few times per week; 3 = once per week; 4 = twice per month; 5 = once per month; 6 = less than once per month; 7 = never. †1 = difficult to understand to 5 = easy to understand.

had seen Picture 2, and 12% of parents *v.* 30% of youths had seen Picture 3. Picture 1 was rated as most difficult to understand, and Picture 2 was rated as easiest to understand.

Youths' and parents' SSB consumption, understanding of BCI messages and awareness of BCI messages did not differ significantly by region. Specifically, youths and parents did not differ across regions on SSB consumption ($F_{(2,35)} = 2.1$, $P = 0.13$ for youths; $F_{(2,30)} = 2.5$, $P = 0.10$ for parents). They also did not differ across region on understanding of any of the BCI messages (for youths, $F_{(2,35)} = 0.8$, $P = 0.46$ for Picture 1, $F_{(2,35)} = 1.7$, $P = 0.21$ for Picture 2 and $F_{(2,35)} = 0.1$, $P = 0.92$ for Picture 3; for parents, $F_{(2,30)} = 0.3$, $P = 0.71$ for Picture 1, $F_{(2,30)} = 1.2$, $P = 0.3$ for Picture 2 and $F_{(2,30)} = 1.00$, $P = 0.38$ for Picture 3). Finally, youths' and parents' awareness of the any of the three BCI messages did not differ by region (for youths, $\chi^2_{(2)} = 2.4$, $P = 0.31$ for Picture 1, $\chi^2_{(2)} = 2.3$, $P = 0.67$ for Picture 2 and $\chi^2_{(2)} = 3.9$, $P = 0.15$ for Picture 3; for parents,

$\chi^2_{(2)} = 5.5$, $P = 0.06$ for Picture 1, $\chi^2_{(2)} = 1.9$, $P = 0.39$ for Picture 2 and $\chi^2_{(2)} = 4.6$, $P = 0.09$ for Picture 3).

Parent and youth themes

Representative quotes are listed in Table 2; themes are discussed below.

Across regions, participants, especially youths, showed mixed or poor comprehension of the Balance Calories Initiative messages (Table 2, code A)

Although most participants rated BCI messages as relatively easy to understand (Table 1), participants showed basic misunderstandings of the messages through their qualitative narratives. Among youths generally, and especially those who were younger, there was confusion about the word 'balance'. Some youths thought that balance meant drinking a greater variety of beverages, in terms of new flavours and different brands, or finding the drink they liked the best. For example, a 10-year-old girl in AL said, 'drink a little bit of each of these drinks,' and a 14-year-old boy in MS said, 'Balance means buy the right drink for you that you like and enjoy.' A few youths and parents thought that the message suggested that sodas now have less sugar.

Although misunderstandings among youths were evident across regions, more misunderstandings seemed to emerge among parents in the South compared with CA. In the South, parents and youths had the additional misconception that dark sodas (e.g. Coke) are less healthy than light sodas (e.g. Sprite). For example, one 46-year-old mother in AL said, 'I see the black boxes of sodas and I see diseases, the darker the beverage is, the badder for the body.'

Some parents and youths believed the Balance Calories Initiative messages endorsed combining healthy and unhealthy activities (Table 2, code B)

Some parents and youths believed that the BCI message of 'balance' conveyed the need to equalize intake of healthy and unhealthy beverages, or to balance unhealthy beverages with healthy food and beverage intake, and exercise. For example, a 15-year-old boy in CA said, 'Balance means keep equally when you drink soda and diet soda,' and a 14-year-old girl in CA said, 'Balance means weigh out bad things with good things.' A 34-year-old mother in AL said, 'Balance means, it does not matter what you eat, drink or do, no matter what it is as long as all balances out,' and a 36-year-old father in CA said that balance means 'not too much, not too little, the right combination of healthy and unhealthy.' These participants understood the message as saying that they can drink SSB if they also exercise, eat healthy foods and/or drink healthy beverages. They did not seem to understand the negative consequences of SSB consumption for health.

Table 2 Parents' (n 33) and youths' (n 38) understanding of and beliefs about the Balance Calories Initiative (BCI) messages, collected in March–August 2017

Code	East Los Angeles/Boyle Heights, CA		Montgomery, AL		North Mississippi Delta, MS	
	Youths (n 12)	Parents (n 10)	Youths (n 14)	Parents (n 11)	Youths (n 12)	Parents (n 12)
A. Poor comprehension of BCI message	'I do not really understand what the word "balance" means ... perhaps balance means to find a drink that you like' (17-year-old girl)	'I think the billboard is promoting to diversify your options of drinks and not to have only Coke or Pepsi, because it is saying "More Beverage Choices" like when you go to restaurants and you can choose also fruit juices, or Seven Up or lemonade' (22-year-old father)	'Balance means what types of drinks do you want, do you like the drink or not' (11-year-old boy)	'Balance means which one is much better for me, which one I would prefer, it also means which drink will help you better with digestion' (32-year-old mother)	'If I try all those drinks in the picture, I will probably find my flavour and my balance' (14-year-old girl)	'Balance in this message means balance out your light drinks with your dark drinks and find your best flavours' (36-year-old mother)
B. BCI message perceived to convey acceptability of SSB	'All of these drinks are good drinks to me, refreshing. Some of them are diet. Balance means find a drink that you really like and balance it out with something that is healthy' (14-year-old boy)	'Balance means that you can eat some food, but walk or go the gym. If you eat greasy food, drink water and exercise, balance your food and drinks with exercising' (42-year-old mother)	'Find your balance between drinking soda and water' (16-year-old boy)	'I'm guessing that is saying everything that you drink, eat and do balance it out. Maybe if you are eating something that is not healthy, drink something that is diet to make it work' (34-year-old mother)	'To me, it says, more beverages, which means is your choice to have less or a lot of sugar in your drinks' (11-year-old boy)	'Balance means equality, it is drinking sodas in moderation' (31-year-old mother)
C. BCI message perceived to be an SSB advertisement	'It is showing sodas – that makes you want to drink sodas' (16-year-old boy)	'I think this is a commercial that is inviting me to drink fresh beverages' (60-year-old father)	'I play sports and drink after playing sports but not soda, I drink water after sports. This picture makes me think I should start drinking these kinds of drinks' (15-year-old boy)	'Drink soda in moderation, I think the billboard is more gearing toward soda, and it has some options; to me is like soda advertisement' (34-year-old mother)	'This picture is making me really thirsty with all these drinks on it, I want to buy a drink' (14-year-old boy)	'The billboard in one hand is saying less pops, less sugar, but on the other hand is advertising more drinks in its bottom part' (25-year-old mother)
D. BCI message perceived to be health promotion	'Balance means to put limitations to the unhealthy stuff that you eat and drink every day ... I should start drinking more water instead of soda' (11-year-old boy)	'Balance means to equalize our meals with vegetables and fruits, and drink a lot of water instead of sodas' (31-year-old mother)	'If you exercise, you do not want to eat junk food, so you want to eat healthy and drink water of course if you are exercising, I guess basically is telling you to stay healthy' (14-year-old girl)	'Balance means watch how many sodas and how much sugar in sodas do you drink and I guess to figure out better ways to drink and eat' (26-year-old mother)	'I think this message is saying that I need to exercise more, then I need to eat less and healthier and drink water. Balance means like do not overdo it, just do it right' (10-year-old girl)	'Eat vegetables, drink and eat healthy' (25-year-old mother)

SSB, sugar-sweetened beverage.

Some parents and youths thought the Balance Calories Initiative messages were promoting sugar-sweetened beverages (Table 2, code C)

Some participants felt that the overall message was an advertisement for SSB, especially Picture 3, which showed the three main beverage company logos. As one 14-year old girl in CA said in response to Picture 3, 'I think the statement "More beverage choices" does not make sense here. It is saying to drink or try more beverages and then saying less sugar. I cannot have less sugar if I'm going to have more beverages choices.' Several participants said that the pictures made them want to drink SSB. For example, in response to Picture 1, a 23-year-old mother in AL said, 'Getting thirsty, hmmm, just thirsty,' and another 22-year-old father in CA said, 'I want to have a soda, I prefer regular sodas than diet sodas, that's all that I can think of.'

Some parents and youths interpreted Balance Calories Initiative messages to be promoting public health recommendations around healthy food and beverage intake, and exercise (Table 2, code D)

Some parents and youths, especially those in CA, interpreted the BCI message as conveying the need to balance healthy eating with exercise and healthy drinks. Others understood the message as communicating a general message about health, without focusing on the word 'balance'. For example, some youths perceived from the messages that they should eat healthy foods, that they should consume beverages with less sugar, that they should reduce their SSB intake, or that they should exercise. Few participants found diet drinks to be acceptable for reducing sugar intake, but many recognized water as healthy. As a 46-year-old mother in CA said of Picture 1, 'It is a little confusing, because I think diet sodas are not good for health, I do not like them and I do not drink them, but in this picture, it seems, diet beverages are ok.'

Food establishment manager themes

Table 3 shows representative quotes from store/restaurant managers for the themes described below.

Knowledge/awareness of the Balance Calories Initiative (Table 3, codes A and B)

Although part of the BCI's mission is to engage food establishments in offering promotions for no- and reduced-calorie beverages, only four managers (25%) were familiar with the BCI logo. However, interviewers observed the BCI logo in seven of the stores, meaning that three managers who were not aware of the logo had been exposed to it.

No manager said that they had been given specific guidance from beverage manufacturers about the BCI. Even the manager of one supermarket that had hosted a BCI event said: 'We have not had any other

communication with anybody from the Balance Calories Initiative, we just had the initial communication ... when they gave us the decals and stickers that we have so far, but nothing else that I'm aware of.' And a restaurant manager in MS said, 'We have not received anything related to the Balance Calories Initiative,' which was consistent with what most other managers communicated.

Beverage marketing (Table 3, codes C and D)

Managers said that they did not communicate regularly with companies about marketing and that placement and advertising of beverages was mainly determined by the owner or corporate headquarters (if the establishment was owned by a national company). Managers said that, in some cases, the beverage manufacturer might install the cooler or have an agreement with the store about shelf space quantity or special floor displays. However, managers said beverage companies mainly engaged in national advertisements or promotions (e.g. coupons), rather than intervening at the local store level.

Managers thought that beverage companies' national advertising efforts for SSB were very effective (and trickled down to the local level) and that within-store discounts were more helpful than other types of promotions for sales. Coupons were seen to be less effective because they had strict rules that needed to be explained to consumers (e.g. expiry date). In terms of their own marketing strategies, managers said that SSB sold better than no- or reduced-calorie beverages. Thus, they were not incentivized to change the placement or pricing of no- and reduced-calorie beverages (as suggested under the BCI) and instead focused on increasing sales of SSB. Accordingly, the study team observed that all stores had more prominent displays promoting SSB than water.

Suggestions for reducing sugar-sweetened beverage consumption (Table 3, code E)

When asked how SSB consumption could be reduced, several suggested reducing beverage container size. One convenience store had negotiated a smaller bottle with American Beverage Association manufacturers, and sales continued to be strong. Others suggested better pricing of no- and reduced-calorie drinks from beverage companies (because they tended to cost more than SSB). Managers were sceptical that beverage companies would be motivated to reduce consumption and that consumers would stop buying SSB; some felt that the only way to decrease obesity rates would be to reformulate SSB to have less sugar with a similar taste.

Discussion

Our results suggest that BCI goals to reduce beverage calories consumed per capita in the USA may not be

Table 3 Store/restaurant managers' (*n* 16) awareness of the Balance Calories Initiative (BCI), marketing strategies for sugar-sweetened beverages (SSB) and relationship to beverage companies, collected in March–August 2017

Code	East Los Angeles/Boyle Heights, CA		Montgomery, AL		North Mississippi Delta, MS	
	Store managers (<i>n</i> 4)	Restaurant managers (<i>n</i> 1)	Store managers (<i>n</i> 4)	Restaurant managers (<i>n</i> 1)	Store managers (<i>n</i> 4)	Restaurant managers (<i>n</i> 2)
A. Awareness of BCI (<i>n</i>)	1	0	2	0	0	1
B. BCI logo observed in store (<i>n</i>)	3	0*	3†	0	1	0
C. Marketing strategies for SSB	'All marketing strategies come from our corporate office' (convenience chain store manager)	'We do not use any marketing strategies ...Coca-Cola and Pepsi do their own marketing and I think that helps a lot with the sales of their products' (independent restaurant manager)	'The main marketing strategy for us is cheaper prices, and for that we ask the Coca-Cola or Pepsi or all the other companies' (chain supermarket manager)	'Mainly, [corporate office] provides marketing materials for [our restaurant's] products and food, not the beverage manufacturer' (chain restaurant manager)	'The most effective strategy here are the prices, if we have good prices, we will sell more and therefore more profits' (convenience chain store manager)	'We get posters and coupons from the sales person, usually we get about 10 000 coupons when a new product comes out. (chain restaurant manager)
D. Relationship with beverage companies	'[Beverage companies] install the coolers and the special displays, but we need to approve them ... we can move the coolers or special displays as we want without informing the companies' (chain supermarket manager)	'We do not have relationships with soda companies at all, we sell only cans of Coca-Cola and Pepsi and we buy them directly from Smart & Final' (independent restaurant manager)	'We make decisions about where to put coolers and displays and where to place our products. The manufacturers may suggest, but is up to the store' (chain supermarket manager)	'[Restaurant] has no relationship with beverage manufacturers ... [corporate office] provides marketing materials for [restaurant's] products and food' (chain restaurant manager)	'We are not required to place the materials that the companies provide us. The sales person who brings all our orders to the store usually gives us some suggestions about where to put their materials, but they do not force us' (convenience chain store manager)	'Pepsi does not decide anything about display or amount of their drinks at [name of restaurant], our corporate office decides all that' (chain restaurant manager)
E. Suggestions for beverage companies to reduce SSB consumption	'Promote intensively to drink more water in all the marketing strategies that they are actually using to promote their best-selling products and to offer smaller sizes of all the drinks and proportional prices according to sizes' (chain supermarket manager)	'Beverage companies should specify exactly what ingredients are in their products and emphasize that some of them can make people addictive to their products' (independent restaurant manager)	'Can reduce the size of the bottles. When I was a kid a 16 oz bottle was huge. Go back to the size they used to be, that would solve a lot of the problem' (convenience chain store manager)	'If beverage companies find different ways to sweeten diet drinks that taste better or more like sugar, then they could reduce consumption, but artificial not good for you, anyway' (chain restaurant manager)	'Come out with healthier drinks and add less sugar in all the drinks. Also, eliminate the TV, radio and Internet advertising, especially that targeting the younger kids and teenagers' (chain supermarket manager)	'Stop using the TV advertising and especially using stars or famous people in the commercials because they have big influence on people's mind' (chain restaurant manager)

TV, television.

*Half of the logo was observed on a cooler that the manager said had come from a previous owner.

†A large logo in the front window of the store was mostly obscured by a plant.

achieved unless BCI messages are revised to convey the health-related risks of high SSB (and sugar) intake. Within each BCI-targeted community, parents and youths were confused by BCI messages or perceived that the messages were promoting SSB consumption, rather than encouraging reduction in SSB intake or cautioning about the health consequences of SSB. Parents and youths commented that the messages communicated that SSB could be consumed in conjunction with healthy beverages and activities. Relatively fewer participants thought that BCI messages indicated an overall focus on health and the need to reduce SSB intake. Some participants believed the BCI messages were advertising SSB, as beverage company logos and products were prominently displayed next to BCI messages. Clinicians and public health practitioners should be made aware of the need to address misunderstandings about SSB consumption, which may be exacerbated by such campaigns.

A key BCI activity is to work with food establishments in BCI-targeted areas, to, for example, change product placement and promote no- and reduced-calorie beverages. Our interviews suggest that beverage companies have not engaged managers to help realize BCI goals. Managers were largely unaware of the BCI and did not intend to change placement and promotions regarding SSB, which generated high profits. Most did not actively work with beverage companies on beverage placement and promotion. In most cases, placement and promotion were determined by corporate offices or the individual store, and most managers had little interaction with beverage companies around these issues. Most managers discussed the much higher profit margin for SSB than for no- and reduced-calorie drinks, and thus they intended to continue promoting SSB. Hence, it seems that a major barrier to obesity prevention initiatives such as the BCI is that managers are incentivized to promote SSB more than no- and reduced-calorie beverages. These findings are consistent with prior research, which has discussed the lack of alignment between the goals of the commercial interests that control the food system and the public health system^(31,32).

Study limitations should be acknowledged. Consistent with qualitative methodology, we used a small convenience sample to explore the range of perceptions across BCI communities and thus our findings cannot be used to determine the prevalence of different kinds of perceptions of BCI messages. Importantly, the BCI was announced in 2014 as a 10-year initiative. As more communities are involved, the beverage companies plan to refine BCI messaging and determine additional ways to engage with food establishments.

A recent progress report on the BCI indicated that beverage calories per capita per day decreased by only 2.8 (1.4%; 11.7 kJ) from 2014 to 2018⁽³³⁾. These results are consistent with prior research that beverage consumption in general is steadily declining among US youths⁽¹⁸⁾, as

well as with studies suggesting that industry self-regulation around SSB may have limited effectiveness^(20,21) unless the beverage industry has a genuine motivation to reduce sales⁽³⁴⁾. Lessons from tobacco industry self-regulation should be heeded when evaluating beverage industry efforts⁽³⁴⁾. For example, in the 1980s, the tobacco industry launched youth anti-smoking campaigns, motivated by a desire to prevent government regulation. Evaluations have indicated that these campaigns lacked effectiveness (and may have even increased youth smoking rates), most likely because the messages did not inform about smoking-related addiction and disease^(35,36) – just as BCI messages do not mention harmful health consequences of sugar consumption. If the BCI's intent is to decrease SSB intake, BCI messages may need to be improved and redeveloped, with input from consumers, clinicians and public health practitioners, and rigorously evaluated by independent researchers.

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References

1. Singh GM, Micha R, Khatibzadeh S *et al.* (2015) Estimated global, regional, and national disease burdens related to sugar-sweetened beverage consumption in 2010. *Circulation* **135**, 639–666.
2. Chen L, Caballero B, Mitchell DC *et al.* (2010) Reducing consumption of sugar-sweetened beverages is associated with reduced blood pressure: a prospective study among United States adults. *Circulation* **121**, 2398–2406.

3. Curhan GC & Forman JP (2010) Sugar-sweetened beverages and chronic disease. *Kidney Int* **77**, 569–570.
4. Collison KS, Zaidi MZ, Subhani SN *et al.* (2010) Sugar-sweetened carbonated beverage consumption correlates with BMI, waist circumference, and poor dietary choices in school children. *BMC Public Health* **10**, 234.
5. Beck AL, Tschann J, Butte NF *et al.* (2013) Association of beverage consumption with obesity in Mexican American children. *Public Health Nutr* **17**, 338–344.
6. Jia M, Wang C, Zhang Y *et al.* (2012) Sugary beverage intakes and obesity prevalence among junior high school students in Beijing – a cross-sectional research on SSBs intake. *Asia Pac J Clin Nutr* **21**, 425–430.
7. Malik VS, Willett WC & Hu FB (2009) Sugar-sweetened beverages and BMI in children and adolescents: reanalyses of a meta-analysis. *Am J Clin Nutr* **89**, 438–439.
8. Francis DK, Van den Broeck J, Younger N *et al.* (2009) Fast-food and sweetened beverage consumption: association with overweight and high waist circumference in adolescents. *Public Health Nutr* **12**, 1106–1114.
9. Santiago-Torres M, Cui Y, Adams AK *et al.* (2015) Familial and individual predictors of obesity and insulin resistance in urban Hispanic children. *Pediatr Obes* **11**, 54–60.
10. Cantoral A, Tellez-Rojo MM, Ettinger AS *et al.* (2016) Early introduction and cumulative consumption of sugar-sweetened beverages during the pre-school period and risk of obesity at 8–14 years of age. *Pediatr Obes* **11**, 68–74.
11. Papandreou D, Andreou E, Heraclides A *et al.* (2013) Is beverage intake related to overweight and obesity in school children? *Hippokratia* **17**, 42–46.
12. Bray GA, Nielsen SJ & Popkin BM (2004) Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. *Am J Clin Nutr* **79**, 537–543.
13. Te Morenga L, Mallard S & Mann J (2013) Dietary sugars and body weight: systematic review and meta-analyses of randomised controlled trials and cohort studies. *BMJ* **346**, e7492.
14. Bremer AA, Byrd RS & Auinger P (2011) Racial trends in sugar-sweetened beverage consumption among US adolescents: 1988–2004. *Int J Adolesc Med Health* **23**, 279–286.
15. Kenney EL, Long MW, Craddock AL *et al.* (2015) Prevalence of inadequate hydration among US children and disparities by gender and race/ethnicity: National Health and Nutrition Examination Survey, 2009–2012. *Am J Public Health* **105**, e113–e118.
16. Levy DT, Friend KB & Wang YC (2011) A review of the literature on policies directed at the youth consumption of sugar sweetened beverages. *Adv Nutr* **2**, issue 2, 182S–200S.
17. Ebbeling CB, Feldman HA, Osganian SK *et al.* (2006) Effects of decreasing sugar-sweetened beverage consumption on body weight in adolescents: a randomized, controlled pilot study. *Pediatrics* **117**, 673–680.
18. Mesirov MS & Welsh JA (2015) Changing beverage consumption patterns have resulted in fewer liquid calories in the diets of US children: National Health and Nutrition Examination Survey 2001–2010. *J Acad Nutr Diet* **115**, 559–566.e4.
19. Wilde P (2009) Self-regulation and the response to concerns about food and beverage marketing to children in the United States. *Nutr Rev* **67**, 155–166.
20. Simon M (2006) Can food companies be trusted to self-regulate – an analysis of corporate lobbying and deception to undermine children's health. *Loy L A L Rev* **39**, 169.
21. Ronit K & Jensen JD (2014) Obesity and industry self-regulation of food and beverage marketing: a literature review. *Eur J Clin Nutr* **68**, 753–759.
22. Alliance for a Healthier Generation (2014) Alliance for a Healthier Generation and America's beverage companies announce landmark CGI commitment to reduce beverage calories consumed across the nation 2014. <https://www.healthiergeneration.org/articles/alliance-for-a-healthier-generation-and-americas-beverage-companies-announce-landmark-cgi/> (accessed March 2018).
23. Van Kleef E, Van Trijp H, Paeps F *et al.* (2008) Consumer preferences for front-of-pack calories labelling. *Public Health Nutr* **11**, 203–213.
24. Centers for Disease Control and Prevention (2016) Behavioral Risk Factor Surveillance System | 2016 BRFSS Survey Data and Documentation. https://www.cdc.gov/brfss/annual_data/annual_2016.html (accessed March 2018).
25. van Someren MW, Barnard YF & Sandberg JAC (1994) *The Think Aloud Method: A Practical Guide to Modelling Cognitive Processes*. London: Academic Press.
26. Sudman S, Bradburn NM & Schwarz N (1996) *Thinking About Answers: The Application of Cognitive Processes to Survey Methodology*. San Francisco, CA: Jossey-Bass.
27. Fonteyn ME, Kuipers B & Grobe SJ (1993) A description of think aloud method and protocol analysis. *Qual Health Res* **3**, 430–441.
28. Ryan GW & Bernard HR (2003) Techniques to identify themes. *Field Methods* **15**, 85–109.
29. Ryan GW & Bernard HR (2011) Data management and analysis methods. In *Handbook of Qualitative Research*, 4th ed., pp. 796–802 [NK Denzin and YS Lincoln, editors]. Thousand Oaks, CA: SAGE Publications, Inc.
30. Cohen J (1960) A coefficient of agreement for nominal scales. *Educ Psychol Meas* **20**, 37–46.
31. Lang T (2009) Reshaping the food system for ecological public health. *J Hunger Environ Nutr* **4**, 315–335.
32. Lang T & Rayner G (2007) Overcoming policy cacophony on obesity: an ecological public health framework for policymakers. *Obes Rev* **8**, 165–181.
33. Keybridge (2018) *2025 Beverage Calories Initiative: Report on 2017 Progress toward the National Calorie Goal*. Washington, DC: Keybridge.
34. Sharma LL, Teret SP & Brownell KD (2010) The food industry and self-regulation: standards to promote success and to avoid public health failures. *Am J Public Health* **100**, 240–246.
35. Landman A, Ling PM & Glantz SA (2002) Tobacco industry youth smoking prevention programs: protecting the industry and hurting tobacco control. *Am J Public Health* **92**, 917–930.
36. Wakefield M, Terry McElrath Y, Emery S *et al.* (2006) Effect of televised, tobacco-company funded smoking prevention advertising on youth smoking-related beliefs intentions, and behavior. *Am J Public Health* **96**, 2154–2160.